

Review literature on Anti- Dandruff Shampoo

*Dheeraj Pal **, *Shashikant Maury*, *Piyush Yadav*, *Manoj Kumar Yadav*, *Shradha Sahu*

Abstract:

The objective of this study was to develop Anti-Dandruff Shampoo formulations. Dandruff- fighting agents zinc pyrithione (ZPT). This is the secret to fighting dandruff and is found in all of our shampoos. It prevents the dandruff- forming microbe, *Malassezia globosa*, from forming scalp irritants. Head & Shoulders uses a unique, highly effective form of ZPT. Dandruff shampoo is not bad for your hair. Increased scratching due to dandruff can also increase hair cuticle damage and dullness. Essentially, as it works to eliminate dandruff, Head & Shoulders keeps your hair looking beautiful by helping prevent dandruff-related damage. Novel delivery systems have been successfully used for pharmaceutical formulations and they can prove to be a promising delivery system for scalp treatment too.

Keywords- ZPT, Liposomes, Anti-dandruff agents, Phytochemicals.

Introduction:

Anti-dandruff agents are intended to reduce the formation of dandruff flakes. The cause for dandruff is not fully understood but the treatment involves the use of a number of “actives” that function either as antimicrobial agents or as anti-mitotic agents. Shampoos are probably the most widely used hair products today; based on synthetic detergents they are relatively insensitive to water hardness. A good shampoo should almost immediately form abundant foam irrespective of the type of water used or the nature of soil or fat to be removed from hair. Though foam formation is not released to the cleansing effect, but people psychologically always prefer a high foam product^[1].



Fig-Anti-Dandruff Shampoo

Dandruff is apparently caused by a fungus called *Malassezia restricta* and *M. globosa*. *Malassezia* formerly called *Pityrosporum* is a yeast causing infection of skin and scalp. Dandruff is a common disorder caused by *Pityrosporum* yeast which affects the scalp condition. Dandruff can't be removed entirely but can only be handled and regulated effectively^[2,3].

Advantage:

1. The anti-dandruff shampoo comes with a soothing formula which easily calms the irritation.
2. It provide healthy hair which is 100% flake free.
3. The addition to calming down the irritation.
4. The anti-dandruff shampoo also reduces the redness.
5. It works to eliminate dandruff, Head & Shoulders keeps your hair looking beautiful by helping prevent dandruff-related damage^[2,4].

Causes & Symptoms:

Those shiny white flakes that you often brush off your collar and shoulders are probably because of a skin condition called Dandruff. It looks harmless but dandruff causes itch and embarrassment. It is a very common condition that is responsible for the constant flaking of scalp skin^[5].

1. Irritated and oily skin
2. Not maintaining clean hygiene and not shampooing enough, as it causes skin cells to accumulate and create flakes and itching.
3. A reaction of our immune system to a type of yeast that lives on the skin called a *Malassezia globosa*.
4. Hormonal issues may be involved because dandruff is most found after puberty in young adults.
5. Sensitivity to hair care products (contact dermatitis).
6. The signs and symptoms may be more severe if you are stressed, and they tend to flare in cold, dry seasons.
7. A red rash due to the itching can also be seen around the scalp, forehead, and ears or forehead that if you are suffering from dandruff^[4,6,7].

Material & Method

Plant materials:

Six medicinal plants were selected for antidandruff studies namely *Albizia amara* (Mimosaceae), *Achyranthes aspera* (Amaranthaceae), *Cassia fistula* (Caesalpiniaceae), *Cassia auriculata* (Caesalpiniaceae), *Datura stramonium* (Solonaceae) and *Azadirachta indica* (Meliaceae). The plant specimens were collected from medicinal garden of Anna University of Technology and authenticated and identified by Botanical Survey of India, Coimbatore^[8].

Isolation of culture:

In the clinical study the organism was isolated from scalp of person suffering from Dandruff and maintained on Sabouraud's media (which is a defined selective media for medically significant fungi and inhibits growth of normal flora) slants and stored in refrigerator at 40°C for one month^[2,9].

Agar Cup Method

Agar Cup method was performed to check the antifungal activities of shampoos. Dixon's media was used to prepare plates. Two days prior inoculated culture of *Malassezia* species in Dixon's broth was maintained to be used for this assay. 500 µL of culture suspension was spread on the petri plates. Each plate contained a well of 0.6 cm in diameter in which 100 µL of 100% concentrations of different shampoos, natural extracts, oils and lotion were added using a micro-pipette. Experiments were done in duplicates with suitable controls^[9,10].

Minimum Inhibitory Concentration (MIC)

MIC was performed in Dixon's agar plates by agar cup method. 24 h active culture of the test organisms were used for this study. The culture of *Malassezia* in Dixon's broth was used for inoculation and incubated at 30°C for 24 h. The same protocol was followed as mentioned above. The concentrations to check the MIC for a given sample used were 2.5%, 5%, 10%, 15%, 20%, 25%, 50%, 75% and 100% (v/v). The dilutions were done using sterile distilled water. Experiments were performed in duplicates with suitable controls^[11,12].

Formulation of shampoo:

Sl. No	Compound	L F (% w/v)
1	Sida cordifolia	15
2	Ocimum sanctum	10
3	Indigoferatinctoria	10
4	Lawsoniainermis	5
5	Hibiscus rosasinensis	5
6	Vetiver zizanooides	5
7	Sapindus indica	20
8	Acacia concinna	20
9	Flax seed	0.15
10	Lemon	q s
11	Guar gum	1
12	Perfume	q s
13	Amla decoction Q.S.	100 ml

Fig- Formula of Anti dandruff shampoo.

Composition of the developed formulation is summarized. Aqueous decoction of *Emblica officinalis* was divided into 2 parts. First part was added with herbal extract and second part was used to mix powders of soap nut and shikakai. Both parts were mixed. To the mixture flashed, guar gum and stabilizer were added with stirring. Shampoo formulation was filtered and made up to the volume using aqueous decoction of *Emblica officinalis*. Developed shampoo was stored in a suitable Container and used for further evaluations^[13-15].

Evaluation:

Physical appearance/visual inspection: The formulation prepared was evaluated for the clarity, color, odor and foam producing ability and fluidity^[16].

Determination of pH: A 10% v/v shampoo solution was constituted in distilled water and the pH of the solution was measured by using a calibrated pH complete^[10].

Determination of solid content percentage: A clean dry evaporating dish was weighed and 4 grams of shampoo was added to the evaporating dish. The evaporating dish with shampoo was placed on the hot plate until the liquid portion was evaporated. The weight of the solid contents present in the shampoo was calculated after drying^[17].

Wetting time: Wetting time was calculated by noting the time required by the canvas paper to sink completely. A canvas paper weighing 0.44 g was cut into a disc of diameter measuring 1-inch. Over the shampoo (1% v/v) surface, the canvas paper disc was kept and the time taken for the paper to sink was measured using the stopwatch^[4,18].

Cleansing action: The cleansing property of the herbal shampoo was evaluated by the application of the shampoo on hair that has not been washed for seven days. The shampoo was used to wash the hair of human

subject that had applied oil 4-5 hours before washing. The performance of the shampoo was assessed on its ability to remove oily dirt from scalp^[19].

Stability Study: The stability of the formulation was studied for a period of four weeks by keeping at temperature of 25-30°C^[9,20].

Skin Irritation Test: Prepared herbal shampoo was applied on skin for 5 minutes after that was washed and tested for irritation or inflammation to the skin^[21].

Conclusion:

Dandruff is a scalp condition that affects more than 50% of the human population and affects the social behaviour of the sufferer along with possessing an unhealthy scalp. Novel formulations containing proven anti-dandruff agents with longer contact time at the site of action are the need of the hour and hence can prove to be advantageous in anti-dandruff treatments.

Reference:

1. Chean Hui Ng, Samer Al- Dhalli; Anti-fungal activity of successive extracts of citrus limon peel for an anti-dandruff shampoo formulation; International Journal of Medical Toxicology & Legal Medicine, Vol. 23(2020).
2. Punyoyai C., Sirilun S., [.....]; Development of anti-dandruff shampoo from the fermented product of ocimum sanctum Linn; Cosmetics [MDPI], 2018.
3. K. Kumar J., E. Jayachandran [...]; Formulation & evaluation of providone iodine liquid anti-dandruff shampoo; Journal of Pharmaceutical sciences & research; Vol.1(3), 2009.
4. Potluri A., S.K.S. Asma, [...]; A Review on herbs used in anti-dandruff shampoo & its evaluation parameters, Research Journal of Topical & cosmetic sciences 2013.
5. Goffin V., Franchiment CP., [.....]; Anti-dandruff shampoos & the stratum corneum; Journal of dermatological Treatment; vol. 7(1996).
6. Gozali D., Rudathillah R., Mustarichie R.; Anti-dandruff shampoo formulation with active substances ethanol extract of brassica oleracea; Research J. of Pharmacy & Technology; Vol.13, 2020.
7. Rafiq S., Nisha A., Shahina SK.J.; Isolation & Characterization of the fungi from Dandruff-Affected Human Scalp Shampoo; IJAR; Vol. 4(9), 2018.
8. Kumar PV., Rao PV., Prince R., Terejamma K, [...]; Formulation & Evaluation of Herbal Anti-Dandruff Shampoo from Bhringraj Leaves; ARC J. of Pharm. Sci.; Vol.4(2), 2018.
9. M. Narshana & Kumar PR.; An Overview of Dandruff and novel formulations as a treatment strategy; International Journal Pharmaceutical Sciences & Research; Vol. 9(2), 2018.

10. NagaNaga PP., Anuradha K., Divya K.; Comparison of potency of antifungal action of dandruff shampoos a different plant extracts; Intrenational Journal of Medical Research & Health Sciences; Vol. 4(2),2015.
11. Sibi G., Gurmeetkaur, Geeta D., Dhananjaya K., [...]; Anti- Dandruff activity of ricinuscommunis L. leaf extracts; International J. of Current Pharmaceutical Research; Vol.4(3), 2012.
12. Kumar PS., Sucheta S., Umamaheswari A., [...]; In vitro & In vivo evaluation of anti- dandruff activity of formulated polyh; Journal of Pharmacy Research; Vol.3 (12), 2010.
13. Potluri A., Harish G., Kumar BP.; Formulation & evaluation of herbal anti- dandruff shampoo; Indian Journal of Research in pharmacy & biotechnology; Vol.1 (6), 2013.
14. Gaikwad PD., Mulay KV., Borade MD.; Formulation and evaluation of herbal shampoo; International Journal of Science and Research; Vol.9 (3), 2020.
15. Malpani T., Jeithliya M., Pal N., Puri P.; Formulation and evaluation of pomegranate based herbal shampoo; Journal of Pharmacognosy and Phytochemistry; Vol.9 (4), 2020.
16. Pundkar AS. & Ingale SP.; Formulation and evaluation of herbal liquid shampoo; World Journal of Pharmaceutical Research; Vol.9 (5), 2020.
17. Bhavsar RS., Sagrulle SD., Unhale SS., [...]; Formulation and Development of sulphate free shampoo; IJRASWT; Vol 8(4), 2020.
18. Vijayalashmi A., Sangeetha S., Ranjith N; Formulation and evaluation of herbal shampoo; Asian Journal of Pharmaceutical and clinical research; Vol. 11(4), 2018.
19. ReddyReddy VS., Reddy DJ., Velu MG.; Formulation and evaluation of anti- dandruff shampoo; Journal of Pharmacy Research; Vol. 10(11), 2016.
20. RevansiddappaRevansiddappa M., Sharadha R., Abbulu K.; Formulation and evaluation of herbal Anti- dandruff shampoo; Journal of Pharmacognosy and Phytochemistry; Vol.7 (4), 2018.
21. Singh A. Saxena A.; Formulation and evaluation of herbal anti- dandruff sha from Bhringraj Leaves; Pharmacy Practice and Research; Vol.1 (1), 2020.