International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2018): 7.426

# Formulation and Evaluation of Herbal Antidandruff Gel

**Biradev S Karande**

Department of Pharmaceutics, Shree Santkrupa Collage of Pharmacy, Ghogaon, Karad, Maharashtra.-India

**Abstract:** ***The present research has been undertaken with the aim to formulate and evaluate the herbal gel containing Alovera leaf powder extract and Shikakai seed powder extract and Azhadirachtaindica leaf extract.The gel formulation was designed by using aqueous, ethanolicextracts in varied concentrations along with different polymer. The physiochemical parameters of formulations (pH, viscosity, spreadability etc.) were determined. The results showed that formulation containing 2.5 gm of ethanolic extract of Alovera leaf powder ,Azhadirachtaindica ,Shikakaihave promising effect than other formulations.***

**Keywords:** *Alovera leaf extract,shikakai,Azhadirachtaindica* leaf extract, Gel, Evaluation

## 1. Introduction

Dandruff is a very common non-contagious hair problem, nearly affecting person irrespective of age. Medically it is defined as pityriasis simplex capitis – shedding of dead skin from the scalp. It may be – dry or grease. Dry dandruff appears silvery and white while greasy flakes appear pale yellowish and may have an unpleasant smell.[1] Historically there have been multiple other descriptive names reflecting the fungal cause of this condition, such as pityriasis simplex and pityriasis capitis (referring to *Pityrosporum*) and furfuracea (referring to *Malassezia furfur*).[2,3] It is a common embarrassing disorder which effects 5% of the global population.[4,5] Dandruff affects the aesthetic value and causes the itching and keratinocytes play major role in the expressions and the generation of immunological reaction during dandruff formation.[6,7] The severity of dandruff may fluctuate with season as a often worsen in winter. Dandruff is common scalp condition that producing the irritating white flakes and itchy scalp. Excessive drying of skin and over-activity of oil gland known as seborrhea.[8-9] To overcome all these side effects an attempt been made to formulate and evaluate Polyherbal antidandruff gel to minimize all these side effects and to show rapid action on Dandruff.[10]

Dandruff is a skin condition that mainly affect the scalp symptoms include flaking and sometimes mild itchiness. it can result in social or self-esteem problem. A more severe form of the condition,which includes inflammation of the skin is known as seborrrhoeicdermatitis(11). The herbs selected for this work were *Azadirachtaindica*, *Alovera* and *Shikakai* are reported to have significant antifungal and anti-inflammatory and antimicrobial activities. The growing popularity of natural and herbal medications, easy availability of raw materials, cost-effectiveness and paucity of reported adverse reaction, prompted us formulate a polyherbal preparation. The combination is used in order to enhance the Dandruff.[12-13]

## 2. Materials and Methods

*Azadirachtaindica*extract, *Alovera leaf* extract, Shikakai seed extract, Carbopol, Poly ethylene glycol, Methyl paraben, Poly vinyl pyrrolidine, Triethanol amine, Glycerin, Water.

**Collection of Plant Material**

The leaves of *Azadirachtaindica,Alovera leaf and of Shikakai seed* collected from local area of Maharashtra In Satara District. The plant materials were taxonomically identified by plant taxonomist. Plant materials are shade dried and coarsely powdered for extraction.

**Preparation of Extract**

Individual powders were weighed transferred into iodine flask and macerated with ethanol for 3 days by intermediate shaking. Filter the macerated powder and finally concentrate the solution to obtain extract.

**Preparation of Herbal Antidandruff Gel**

Measured quantity of methyl paraben, glycerin and weighed quantity of polyethylene glycol were dissolved in about 35 ml of water in beaker. Then it was stirred at high speed using mechanical stirrer. Carbopol 940 and Poly Vinyl Pyrolidine were added slowly to the beaker containing above liquid while stirring. Triethanolamine (Neutralising agent) was added slowly while stirring till to attain gel structure. Required proportions *of Azadirachtaindica extract, Alovera leaf*extract, *Acaciaconcinna*extracts were added to the prepared gel and stirred continousely to form proper gel. The details are shown in table 1. continuously to form proper gel. The details are shown in table 2

**Table 1:** Composition of Herble Anti-Dandruff Gel1(F1)

| SR. No. | Ingredients | Quantity |
|---|---|---|
| 1. | Azadirachtaindica | 0.5g |
| 2. | Acaciaconcinna | 0.5g |
| 3. | Aloe barbadensis mill | 0.5g |
| 4. | Carbopol | 0.3g |
| 5. | Poly ethylene glycol | 7g |
| 6. | Methyl paraben | 0.0075g |
| 7. | Poly vinyl pyrrolidone | 0.05g |
| 8. | Triethanolamine | 0.6ml |
| 9. | Glycerine | 3ml |
| 10. | Water | Upto 50ml |

**Table 2:** Composition of Herbalanti-Drandrufff Gel **2** (F2)

| S.No | Ingredients | Quantity |
|---|---|---|
| 1 | *Alovera leaf*extract | 0.5g |
| 2 | *Acaciaconcinna*extract | 0.5g |
| 3 | Carbopol | 0.3g |
| 4 | Poly ethylene glycol | 7g |
| 5 | Methyl paraben | 0.075g |
| 6 | Poly vinyl pyrrolidone | 0.05g |
| 7 | Triethanol amine | 0.6ml |
| 8 | Glycerine | 3ml |
| 9 | Water | Up 50Ml |

**Evaluation Methods of Formulation**

**Physical Evaluation-**
Physical parameters such as color, appearance and consistency were checked visually.

**Washability-**
Formulations were applied on the skin and then ease and extent of washing with water were checked manually.

**pH**
pH of 1% aqueous solution of the formulations was measured by using a calibrated digital pH
meter at constant temperature

**Spreadability**
Spreadability of gels was measured with the glass slide apparatus, excess of cream was placed between two slides and 1 kg weight was placed on slide for 5 min to compress the sample to uniform thickness, time in seconds to separate two slides was taken as measure of spreadability.
$S = w l / t$
where,
S = Spreadability (g cm/sec)
w = weight on upper slide (g)
l = length of Slide (cm)
t = time taken in sec (sec)

**Homogeneity**
The developed gels was tested for homogeneity by visual inspection, after the gel have been set in the container, spread on the glass slide for the appearance, tested for the presence of any lumps, flocculates or aggregates.

**Viscosity**
Brook field viscometer was used to determine viscosity. The sufficient quantity of gel was filled in wide mouth jar separately, the height of the gel was filled in the wide mouth jar should sufficiently allow to dip the spindle. The RPM of the spindle was adjusted to 2.5 RPM. The viscosities of the formulations were recorded.

**Skin Irritation Test**
The skin irritation was carried out on human volunteers. For formulated gel, five volunteers were selected and 1.0g of formulated gel was applied on an area of two square inch to the back of the hand. The volunteers were observed for lesions or irritation.

**Microbial Assay**
The antifungal activities of different formulations was determined by modified agar well diffusion method.

**Method**
Add 0. 1 ml of the inocculum/10 ml of previously molten sabouraud dextrose agar media, shake well to disperse equally and immediately pour in sterile plates, allow to solidify taking care that the thickness of layer is uniform and incubated for 24 hours at 22-27°C.

**Procedure for activity**
0.1 ml of the Drug mixtureinoculum / 10 ml of previously molten sabouraud dextrose agar media, shake well to disperse equally and immediately pour in sterile plates, allow to solidify taking care that the thickness of layer is uniform. Two wells were prepared in each agar plate. Pour the standard solution in one plate with 50ug/ml concentrations. In another plate prepared formulations 1 and 2 are transferred into the wells with 50ug/ml concentrations. and perform the above process to gel base also. Plates are kept for incubation for 24 hrs at 22-27°C.[16-19]

## 3. Results and Discussion

The evaluation parameters are performed and the results are listed in Table 3, 4 and 5. Formulations of F1 and F2 were pale brown in Color with semisolid consistency, formulations were found homogenous, easily washable. Formulations had very slightly alkaline pH which were compatible with normal skin physiology. Anti fungal activities were performed for the formulations F1, F2 and Marketed. From the results it is clearly evident that the formulation with *Azadirachtaindica* extract (F1) has shown good anti fungalactivity to the dandruff causing organism Malassezia furfur when compared to the formulation without *Azadirachtaindica*extract (F2) and F1 shown nearer results when compared to the marketed product.

**Table 3:** Evaluation of Herbal Anti-Dandruff Gel (F1 and F2)

| Samples (Formulations & Extracts) | Color | Consistency | Washability | pH |
|---|---|---|---|---|
| Marketed | Colorless | - | Good | 7.04 |
| *Azadirachtaindica* extract | Brown | - | Good | - |
| *Alovera leaf* extract | Brown | - | Good | - |
| *Acaciaconcinna* extract | Brown | - | Good | - |
| F1 | Pale brown | Semi-solid | Good | 7.02 |
| F2 | Pale brown | Semi-solid | Good | 7.01 |

**Table 4:** Evaluation of Herbal Anti-Dandruff Gels (F1 and F2)

| Samples (Formulations & Extracts) | Spreadability (gm-cm/sec) | Homogeneity | Viscosity (cps) | Skin irritation test |
|---|---|---|---|---|
| Marketed | 11.136 | - | - | No irritation |
| Azadirachtaindica extract | - | - | - | No irritation |
| Alovera leaf extract | - | - | - | No irritation |
| Acaciaconcinna extract | - | - | - | No irritation |
| F1 | 8.762 | No lump | 3971 | No irritation |
| F2 | 7.130 | No lump | 3742 | No irritation |

**Table 5:** Evaluation of poly herbal Anti-dandruff gels (F1 and F2)

| S. No | Samples (Formulations & Extracts) | Zone of inhibition (mm) |
|---|---|---|
| 1 | Marketed | 11 |
| 2 | Gel base | Nil |
| 3 | *Azadirachtaindica*extract | 8 |
| 4 | *Alovera leaf* extract | 6 |
| 5 | *Acaciaconcinna* extract | 7 |
| 6 | F1 | 9 |
| 7 | F2 | 7 |

## 4. Conclusion

Now the world market is moving towards the herbal medicines for health care and beauty care. An Indian traditional literature and ethanopharmacological study shows a number of plants have the medicinal use. In this study using *Azadirachtaindica*, *Alovera*and *Acaciaconcinna*are already reported as antifungal and anti-inflammatory and antimicrobial activities. Present investigation was carried out to formulate Poly herbal anti dandruff gel based on traditional knowledge and evaluate parameters. From this investigation it is clearly concluded that the prepared herbal formulation has shown good antifungal activity, clearly evident by observing results of the antifungal studies. Formulation F1 showed good antifungal activity compared to formulation F2 and the results of formulation F1 are very nearer compared to standard drug which clearly indicates that the prepared formulation is best suits for anti – dandruff activity as it is acting against *Melassezia furfur*

## 5. Acknowledgement

Authors wish to express their thanks to all faculty members and my friends of the college for their help and co-operation while carrying out this research work

## References

[1] Hay RJ, Graham BR. andruff and Seborrheic Dermatitis: causes and management, Clin Exp. Dermatol, 1997; 22: 3-6.
[2] Agarwal UP, Prajakta S. Evaluation of clinical efficacy and safety of anti dandruff hair cream for the treatment of dandruff, The Antiseptic, 2009; 106: 37-39.
[3] Ranganathan S, Mukhopadhyay T. Dandruff: the most commercially exploited skin disease. Indian J Dermatol, 2010; 55(2): 130-4.
[4] Janniger CK, Schwartz RA. Seborrheic dermatitis. Am Fam Physician, 1995; 52: 149-55.
[5] Saint DL. The history of dandruff and dandruff in history, a homage to raymond sabouraud anndermatolvenereol, 1990; 117: 23- 27.
[6] Gupta AK, Batra R, Bluhm R, Boekhout T, Dawson TL. Jr. Skin disease associated with Malassezia species. journal am acaddermatol, 2004; 51: 785-98.
[7] Pitard CF, Xhauflaire EU, Pitard GE. Revisiting dandruff, international journal of cosmetic science, 2006; 28: 311-318.
[8] Pitard CF, Pitard GE, Klingman A. Seasonal modulation of the sebum excreation, dermatoligica, 1990; 181: 21-22.
[9] Vijayanthi G, Kulkarni C, Abraham A, Kolhapure SA. Evaluation of antidandruff activity and safety of polyherbal hair oil, an open pilot clinical trial, the antiseptic, 2004; 101(9): 368-372.
[10] Anupam D, Amit Kumar T, Rohit Kumar M, Ahsan K, Anand P, Awadhesh K and Ashok Kumar B. Botanicals for the management of dandruff. Medicinal Plants, 2012; 4(2): 55-64.
[11] Borda,Luis (2015).Seborrheic Darmatitis and Dnadruff. A Comprehensive Review .Journal of clinical and Investigative Dermatology.
[12] Maragathavalli S, Brindha S, Kaviyarasi NS, Annadurai B, Gangwar SK. Antimicrobial activity in leaf extract of neem (Azadirachtaindica Linn.). Int Jour Science Nature, 2012; 3: 110-
[13] Rajkumar P, Murari Prasad and Nand KS. Anticancer biology of Azadirachtaindica L (neem). Cancer Biology & Therapy, 2011; 12(6): 467-476.
[14] Prabhsimran SS, KawalpreetKaur, Varish A, Lokesh Kumar, Pradeep Kumar, Salam M, Khan MA. Screening of Antimicrobial activity of Aqueous extracts of Leaves, Flower and Stem of Ecliptaalba. Int. J. Drug Dev. & Res, 2012; 4(4): 142-147.
[15] Praveen SP, Vinod MR, Karnakumar VB, Chandrashekhar BP and Sreenivasarao K Development and evaluation of Anti-dandruff hair gel. Int Jour Res Pharma Chemistry, 2011; 1(4): 936-944.
[16] Mutimer MN, Riffikin C, Hill JA. Modern ointment bases technology – II – Comparative evaluation of bases. J. Am. Pharm Assoc, 1956; 45: 212-218.
[17] Pandey A, Jagtap JV, Polshettiwar SA. Formulation and evaluation of in vitro antimicrobial activity of gel containing essential oils and effect of polymer on their antimicrobial activity. Int J Pharm PharmSci, 2011; 3(1): 234-237.
[18] Mehrotra S, Srivastava AK and Nandi SP. Comparative antimicrobial activities of Neem, Amla, Aloe, Assam tea and Clove extracts against Vibrio cholera, Staphylococcus aureus and Pseudomonas aeruginosa. J Med Plants Res, 2010; 4(18): 2473-2478.
[19] Madan J, Singh R. Formulation and evaluation of Aloe vera topical gels. Int J Pharm Sci, 2010; 2(2): 551-555.