

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

"Innovative Approaches in Psoriasis Therapy: Formulation of a Topical Gel with Traditional Medicinal Plants"

Miss. Prachi Pokale, Mrs. Vaishnavi Katkar, Dr. Gaffar Sayyed, Dr. Sanjay Garje

SAJVPM's College of Pharmaceutical Science And Research Center Kada, Tal-Ashti, Dist- Beed, Maharashtra, India-414202.

Abstract:

The present study is to formulate And evaluate the herbal gel psoriasis containing natural products such as Aloe Vera, Brahmi, Turmeric, Ashwagandha. The evaluations of all formulations were done on different parameters like pH; viscosity, Spreadibilty, and stability were examined. These Formulations are safe to use for skin. These studies suggest that the composition of extracts and base of gel are more stable and safer, it may produce synergistic action.

Key Words: Herbal gel, Aloe vera, Brahmi, Ashwagandha

Introduction:

The skin is the body's biggest organ, made of water, protein, fats and minerals. Our skin shields your body From microbes and controls internal heat level. Nerves in the skin assist you with feeling sensations like Hot and cold.Our skin, alongside with hair, nails, oil organs and sweat organs, is important for the Integumentary framework. "Integumentary" signifies a body's external covering. Three layers of tissue Make up the skin: Epidermis, the top layer, Dermis, the centre layer, Hypodermis, the base or greasy Layer. Your epidermis is the top layer of the skin that you can see and contact. Keratin, a protein inside Skin cells, makes up the skin cells and, alongside different proteins, remains together to frame this Layer. Theepidermis:Acts as a defensive barrier Makes new skin, Makes new skin, Protects your Body. The dermis makes up 90% of skin's thickness. This centre layer of skin; Has collagen and Elastin, Grows hair, Keeps you in contact, Produces sweat, Supplies blood. The base layer of skin, Or hypodermis, is the greasy layer. The hypodermis is the Cushions muscles and bone, Has connective Tissue, Helps the nerves and veins, Regulates internal heat level.

Psoriasis:

Psoriasis is a chronic condition that often affects the skin and can have a significant impact on a person's quality of life. The overproduction of skin cells is a key factor in psoriasis, leading to the thickened, scaly plaques yo described. The exact cause of psoriasis is still not fully understood, but it's believed to involve an immune system malfunction where the body's defense system attacks healthy skin cells, accelerating cell turnover. This results in the rapid buildup of skin cells, forming the characteristic patches of scaling. Psoriasis is a chronic condition that often affects the skin and can have a significant impact on a person's quality of life.

The overproduction of skin cells is a key factor in psoriasis, leading to the thickened, scaly plaques you described. The exact cause of psoriasis is still not fully understood, but it's believed to involve an immune system malfunction where the body's defense system attacks healthy skin cells, accelerating cell turnover. This results in the rapid buildup of skin cells, forming the characteristic patches of scaling. In addition to the physical symptoms, psoriasis can also be associated with other conditions like psoriatic arthritis, which affects the joints. Stress, certain medications, infections, and even weather changes can trigger flare-ups.

There are several types of psoriasis, each of which varies in its signs and symptoms:



Fig. no 1

Herbal Gel:

Topical application of gels at pathological sites offer Great advantage in a faster release of drug directly to site Of action, independent of water solubility of the drug as Compared to creams and ointments. Bacopa monnieri (Family:Scrophulariaceae) is Phytochemicals rich in steroids, alkaloids, tannins, Triterpenes, flavonoids and glycoside. The antioxidant compounds in Brahmi may protect skin cell membranes from lipid peroxidation, supporting skin barrier integrity—a key factor in psoriasis management. Bacosides have also been linked to wound healing and tissue regeneration in preclinical studies, which could aid in repairing psoriatic lesions. Oxidative stress and inflammation are closely linked in psoriasis. The flavonoids and phenolic in Brahmi have demonstrated anti-inflammatory properties by inhibiting pro-inflammatory pathways (e.g., NF- κ B), which could reduce the severity of psoriatic inflammation.





Withania somnifera also rich in steroids. Both been found to be Used traditionally for their various therapeutic Properties like, anticancer And oral Anti-inflammatory, antibacterial, antioxidant, Skin disorder and wound healing activities. Steroids, tannins, flavonoids, carbohydrates and alkaloids and has been found to be used traditionally for various therapeutic Properties like, antiviral, antidiabetic, antifunga, Antibacterial, antioxidant, antiulcer, skin disorder And wound-healing activities. Preparation of herbal gel is which give effect like moisturizer, cooling ,reduce skin irritation, reduce skin inflammation, reduce rashes.

Advantages of Herbal Gel:

- 1. Topical drug delivery excels in providing localized effects. Skin conditions, for instance, can be treated directly without affecting other bodily systems. This is particularly beneficial in cases where systemic absorption of a drug might lead to unwanted effects.
- 2. By bypassing the digestive system and first-pass metabolism in the liver, topical drugs significantly decrease the likelihood of systemic side effects.
- 3. Convenience and Ease of Use
- 4. Topical drug delivery is non-invasive, which is especially beneficial for patients who may have difficulty swallowing pills or who are averse to injections.
- 5. Potential for Controlled Release
- 6. Suitability for Dermatological Conditions.

Materials And Methods:

Materials-

1. Selection: The main ingredient selected for the preparation of herbal gel in the present study was Bacopa Monnieri (Brahmi), Ashwagandha.

2. Collection: Fresh drug was collected from Ahilyanagar.

Chemicals: Chemicals such as Triethanolamine, Carbopol 934, Methyl Paraben, Propyl Paraben, Glycerine and Rosemary oil were collected from laboratory of SAJVPM'S, COPSRC, Kada, Beed.

Method-

A. Extraction of Plant Material :

- 1. Fresh powder of drug is taken in beaker.
- 2. Methanol is used as solvent about 150ml of each is taken.
- 3. Maceration method is used for extraction.
- 4. Aluminium foil is used to cover beaker.
- 5. Stir it in some time interval.
- 6. Allow it stand for 3 days.
- 7. After 3 days filter by using Whatman filter paper.
- 8. Give heat to extract

B. Pre-formulation Study:

Pre-formulation studies are needed to ensure the development of a stable as well as effective and safe formulation. It is a stage of development during which the pharmacist characterizes the physiochemical properties of the drug substance and its interaction with various formulation components.

- To determine the necessary physiochemical parameter of a new drug substance.
- · To establish its compatibility with excipients of formulation.

C. Preparation of Herbal Gel :

Table no. 1 Formulation of Gel Formulation

Sr.no.	Ingredients	Properties		
1	Brahmi	Anti-oxidant, Anti inflammatory		
2	Ashwagandha	Anti inflammatory		
3	Aloe Vera Gel	Antioxidant, Moisturizer		
4	Turmeric	Anti-oxidant, Anti inflammatory		
5	Propylene glycol	Moisturizer		
6	Carbopol 934	Binder		
7	Triethanolamine	Neutralizer		
8	Methyl Paraben	Preservative		
9	Glycerine	Humactant		

10	Rose Water	Fragrance
11	Distilled Water	Solvent

D. Preparation Of Herbal Gel :



With continuous Stirring and add triethanolamine to adjust Ph to desired level



Fig. No. 2 Herbal Gel

Composition of gel formulation:

Sr.no.	Ingredients	F1	F2
1	Brahmi	4gm	4gm
2	Ashwagandha	4gm	4gm
3	Turmeric	2gm	2gm
4	Aloe vera	4gm	4gm
5	Trimetanolamine	1gm	lgm
6	Carbopol	2gm	2gm
7	Methylene Parabean	0.1gm	0.1gm
8	Propylene Glycol	4ml	4ml
9	Glycerine	-	5ml

Table No. 2 Composition of Formulation

10	Rose Water	2ml	2ml
11	Distilled Water	q.s.	q.s.

Result and Evaluation:

Phytochemical Screening of Flower extract of Bacopa monnieri

1. Test for Flavonoid-

- i. A few drops of dilute sodium hydroxide were added to 1ml of the extract. An intense yellow colour was produced in the extract, which become colourless indicates the presence of flavonoids.
- ii. A mixture of zinc dust and concentrated hydrochloric acid added to the extract. Formation of red colour occurs after few minutes indicates presence of flavonoids.

2. Test for Alkaloid-

A few drops of Wagner's reagent (iodine in potassium iodide) were added to the 1 ml of extract. A red brown ppt confirms the presence of alkaloids.

Test	Observation	Inferance
Wagner's reagent test : A few drops of Wagner's	Reddish brown ppt	Presence of Alkaloid
reagent were added to 1 ml of extract		
Alkali reagent test : A few drops of dilute NaOH were added to 1 ml of extract.	Intense yellow colour changes to colourless on adding few drops of NaOH	Presence of Flavonoids
A mixture of zinc dust and concentrated Hydrochloric	Formation of red colour after few minutes	Presence of Flavonoids
acid added to the extract.		

Evaluation Parameter of Herbal Gel:

I. Organoleptic Properties:-

The organoleptic test of a gel preparation was performed visually including colour, odour, and texture.

- a. Colour Light Yellow
- b. Odour Pleasant
- c. Texture Smooth

II. pH Test:-

pH of gel was evaluated by pH paper. The pH of skin gel should be in range of 5 - 7. The pH of formulation was found to be 6.

III. Homogeneity:-

The homogeneity of the formulation was confirmed visually by the absence of any particulate matter and also by touching the product.

IV. Spreadability:-

Spreadability is determined in terms of how long it takes for two slides to separate from gel that is placed in their small gaps under the influence of a specific load. Spreadability is improved if two slides can be separated in less time. The formulation had good spreadability.

V. Viscosity:-

Viscosity of the formulation was analysed by the Brooke fields viscometer. The viscosity for the gel formulation is ranged from 3405.97 - 4604.96 cps.

VI. Washability:-

To determine the washability of a formulation a small amount of gel applied to the skin and wash under tap water with minimal force to remove the gel. It is Washable.

VII. Irritancy:-

Test The gel was applied on the skin surface and kept for few minutes. The gel shows no signs of irritancy after application.

VIII. Extrudability:-

Extrudability was determined by the time required by the sample to completely extrude from the container.

IX. Stability:-

Stability of a formulation was evaluated by placing formulation at different temperature conditions, for 1 months and evaluated for parameters like colour, odour, pH and consistency.

X. Consistency:-

The consistency of formulation was semi-solid.

Sr.no.	Evaluation Parameter	F1	F2
1	Colour	Light Brown	Dark Brown
2	Odour	Pleasent	Pleasent
3	texture	Rough	Smooth
4	рН	5	6
5	Homogeneity	Good	Good
6	Spreadability	Not so Good	Good
7	Viscosity	3714+0.21	3671+0.58
8	Washability	Washable	Washable
9	Irritancy	Not Irritable	Not Irritable
10	Extrudability	Good	Good
11	Stability	Stable	Stable
12	Consistency	Semi-solid	Semi-solid

Table No. 3 Evaluation Parameters of Gel

Conclusion:

The present research work focused on the formulation and evaluation of a herbal gel using Bacopa monnieri (Brahmi), along with Ashwagandha, Turmeric, and Aloe Vera, to provide a safe and effective topical treatment for psoriasis, a chronic inflammatory skin disorder. The formulation was developed using natural ingredients with known anti-inflammatory, antioxidant, antimicrobial, and wound healing properties.

Phytochemical screening confirmed the presence of flavonoids and alkaloids in Bacopa monnieri, supporting its therapeutic potential in psoriasis management. The gel was evaluated for various physical and chemical parameters such as pH, viscosity, spreadability, homogeneity, extrudability, washability, and stability. The results demonstrated that the gel had an acceptable pH (around 6), smooth texture, good spreadability, and was non-irritating and stable over time.

In conclusion, the prepared herbal gel was found to be a stable, non- irritant, and potentially effective formulation for topical application in psoriasis. This study supports the use of herbal-based topical therapies as a natural, safe, and patient-compliant alternative to synthetic medications for managing skin disorders like psoriasis. Further clinical studies are recommended to establish its efficacy on a larger scale.

Reference:

- 1. Michelle AL, Anne MB, James GK: Pathogenesis and therapy of psoriasis. Nature. 2007; 445:866-872.
- Sanaa EG, Maha F, Basma M, Fatma EZ. Betamethasone dipropionate gel for treatment of localized plaque psoriasis. International Journal of Pharmacy and Pharmaceutical Sciences. 2017; 9:173-182.
- Susmitha S, Vidyamol KK, Ranganayaki P, Vijayaragavan R. Phytochemical Extraction and Antimicrobial Properties of Azadirachta indica (Neem). Global Journal of Pharmacology. 2015; 7:316-320.
- Debjit B, Chiranjib, Jitender Y, Tripathi KK, Sampath Kumar KP. Herbal Remedies of Azadirachta indica and its Medicinal Application. Journal of Chemical and Pharmaceutical Research. 2010; 2:62-72.
- Birendra KB, Ashok KP: Green synthesis of Gold nanoparticles using neem (Azadirachta indica L.) leaf extract and its biomedical applications. International Journal of Advanced Biotechnology and Research. 2014; 5:457-464.
- Mahmoud DA, Hassanein NM, Youssef KA, Abouzeid MA: Antifungal activity of different neem leaf extracts and the nimonol against some important human pathogens. Brazilian Journal of Microbiology. 2011; 42:1007-1016.
- Patrick VQ, Márcia LG, Maria AG, Raimunda C, David FL, Carlos N, Marcos PN et al. Effect of neem (Azadirachta indica A. Juss) leaf extract on resistant Staphylococcus aureus biofilm formation and Schistosoma mansoni worms. Journal of Ethnopharmacology. 2015; 175:287-294.

8. J Diet Suppl

9. 2021;18(2):183-226. doi: 10.1080/19390211.2020.1741484. Epub 2020 Apr 3. Pharmacological evaluation of Ashwagandha highlighting its

healthcare claims, safety, and toxicity aspects

- 10. Sreedevi T., Ramaya Devi D., Vedha Hari B.N. An emerging era in topical delivery: Organogels. Int. J. Drug Dev. Res. 2012;4:35–40. [Google Scholar]
- Kolahdooz S., Karimi M., Esmaili N., Zargaran A., Kordafshari G., Mozafari N., Ayati M.H. Evaluation of the efficacy of a topical chamomile-pumpkin oleogel for the treatment of plaque psoriasis: An intra-patient, double-blind, randomized clinical trial. Biomed. Res. Ther. 2018;5:2811–2819. doi: 10.15419/bmrat.v5i11.499. [DOI] [Google Scholar]
- 12. Rehman K., Tan C.M., Zulfakar M.H. Development and In-vitro Characterization of Fish Oil Oleogels Containing Benzoyl Peroxide and Salicylic Acid as Keratolytic Agents. Drug Res. 2014;6:159–165. doi: 10.1055/s-0033-1355351. [DOI] [PubMed] [Google Scholar]
- Lee C.H., Moturi V., Lee Y. Thixotropic property in pharmaceutical formulations. J. Control. Release. 2009;136:88–98. doi: 10.1016/j.jconrel.2009.02.013. [DOI] [PubMed] [Google Scholar]
- Naga Sravan Kumar Varma V., Maheshwari P.V., Navya M., Reddy S.C., Shivakumar H.G., Gowda D.V. Calcipotriol delivery into the skin as emulgel for effective permeation. Saudi Pharm. J. 2014;22:591–599. doi: 10.1016/j.jsps.2014.02.007. [DOI] [PMC free article] [PubMed] [Google Scholar]
- 15. Sarafian G., Afshar M., Mansouri P., Asgarpanah J., Raoufinejad K., Rajabi M. Topical Turmeric Microemulgel in the Management of Plaque Psoriasis: A Clinical Evaluation. Iran J. Pharm. Res. 2015;14:865–876. [PMC free article] [PubMed] [Google Scholar]
- Pandey S.S., Maulvi F.A., Patel P.S., Shukla M.R., Shah K.M., Gupta A.R., Joshi S.V., Shah D.O. Cyclosporine laden tailored microemulsion-gel depot for effective treatment of psoriasis: In vitro and in vivo studies. Colloid. Surf. B Biointerfaces. 2020;186:110681. doi: 10.1016/j.colsurfb.2019.110681.
 [DOI] [PubMed] [Google Scholar]
- Miastkowska M., Kulawik-Pióro A., Szczurek M. Nanoemulsion Gel Formulation Optimization for Burn Wounds: Analysis of Rheological and Sensory Properties. Processes. 2020;8:1416. doi: 10.3390/pr8111416. [DOI] [Google Scholar]
- Ahmad J., Gautam A., Komath S., Bano M., Garg A., Jain K. Topical Nano-emulgel for Skin Disorders: Formulation Approach and Characterization. Recent Pat. Antiinfect. Drug Discov. 2019;14:36–48. doi: 10.2174/1574891X14666181129115213. [DOI] [PubMed] [Google Scholar]
- Algahtani M.S., Ahmad M.Z., Ahmad J. Nanoemulgel for Improved Topical Delivery of Retinyl Palmitate: Formulation Design and Stability Evaluation. Nanomaterials. 2020;10:848. doi: 10.3390/nano10050848. [DOI] [PMC free article] [PubMed] [Google Scholar]
- 20. Int J Mol Sci. 2021 May 12;22(10):5124. doi: 10.3390/ijms22105124Polymeric Gels and Their Application in the Treatment of Psoriasis Vulgaris: A ReviewAgnieszka Kulawik-Pióro 1,*, Małgorzata Miastkowska 1,*
- Shahid M, Subhan F, Ullah I, Ali G, Alam J, Shah R. Beneficial effects of Bacopa monnieri extract on opioid induced toxicity. Heliyon. (2016) 2:e00068. 10.1016/j.heliyon.2016.e00068 [DOI] [PMC free article] [PubMed] [Google Scholar]
- Sumathi T, Devaraj SN. Effect of Bacopa monniera on liver and kidney toxicity in chronic use of opioids. Phytomedicine. (2009) 16:897–903. 10.1016/j.phymed.2009.03.005 [DOI] [PubMed] [Google Scholar]
- Srivastav S, Fatima M, Mondal AC. Bacopa monnieri alleviates paraquat induced toxicity in Drosophila by inhibiting jnk mediated apoptosis through improved mitochondrial function and redox stabilization. Neurochem Int. (2018) 121:98–107. 10.1016/j.neuint.2018.10.001 [DOI] [PubMed] [Google Scholar]
- 24. Jyoti A, Sethi P, Sharma D. Bacopa monniera prevents from aluminium neurotoxicity in the cerebral cortex of rat brain. J Ethnopharmacol. (2007) 111:56–62. 10.1016/j.jep.2006.10.037 [DOI] [PubMed] [Google Scholar]
- Velaga MK, Basuri CK, Robinson Taylor KS, Yallapragada PR, Rajanna S, Rajanna B. Ameliorative effects of Bacopa monniera on lead-induced oxidative stress in different regions of rat brain. Drug Chem Toxicol. (2014) 37:357–64. 10.3109/01480545.2013.866137 [DOI] [PubMed] [Google Scholar]
- Ayyathan DM, Chandrasekaran R, Thiagarajan K. Neuroprotective effect of Brahmi, an ayurvedic drug against oxidative stress induced by methyl mercury toxicity in rat brain mitochondrial-enriched fractions. Nat Prod Res. (2015) 29:1046–51. 10.1080/14786419.2014.968153 [DOI] [PubMed] [Google Scholar]
- 27. Dwivedi S, Nagarajan R, Hanif K, Siddiqui HH, Nath C, Shukla R. (2013). Standardized extract of Bacopa monniera attenuates okadaic acid induced memory dysfunction in rats: effect on Nrf2 pathway. Evid Based Complem Altern Med. (2013) 2013:294501. 10.1155/2013/294501 [DOI] [PMC free article] [PubMed] [Google Scholar]
- 28. Pham HTN, Phan SV, Tran HN, Phi XT, Le XT, Nguyen KM, et al. Bacopa monnieri (L.) ameliorates cognitive deficits caused in a trimethyltin-induced neurotoxicity model mice. Biolo Pharm Bull. (2019) 42:1384–93. 10.1248/bpb.b19-00288 [DOI] [PubMed] [Google Scholar]
- Brimson JM, Prasanth MI, Plaingam W, Tencomnao T. Bacopa monnieri (L.) wettst. Extract protects against glutamate toxicity and increases the longevity of Caenorhabditis elegans. J Trad Complemen Med. (2020) 10:460–70. 10.1016/j.jtcme.2019.10.001 [DOI] [PMC free article] [PubMed] [Google Scholar]
- Sireeratawong S, Jaijoy K, Khonsung P, Lertprasertsuk N, Ingkaninan K. Acute and chronic toxicities of Bacopa monnieri extract in Sprague- Dawley rats. BMC Complement Altern Med. (2016) 16:249. 10.1186/s12906-016-1236-4 [DOI] [PMC free article] [PubMed] [Google Scholar].