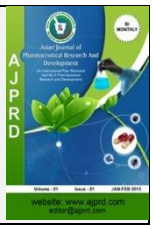
Available online on 15.4.2022 at http://ajprd.com

Asian Journal of Pharmaceutical Research and Development

Open Access to Pharmaceutical and Medical Research



Open Access

Research Article

Phyto Analysis, Formulation, and Evaluation of Herbal Lotion Produced From Allium Sativum and Phyllanthus Emblica Alcoholic Extracts

Mukut Raj, Girish kumar vyas, Dr. Shailesh Sharma, Anil Sharma

School of Pharmaceutical Studies, Faculty of Health Sciences, Dr. K. N. Modi University, Newai, Rajasthan

A B S T R A C T

Herbal cosmetics are concoctions that are used to beautify and improve the look of humans. The purpose of this study was to develop and test a herbal antibacterial lotion formulation that included an alcohol-based fruit extract. Recent research in numerous parts of the world has found that the active components of Allium sativum and Phyllanthus emblica fruits have a great potential for treating a wide range of health conditions. Microbial/worm infection can be efficiently combated using Allium sativum and Phyllanthus emblica preparations. It's anti-inflammatory, anti-cancer, and anti-microbial. The prepared lotion displayed good consistency and spreadability, homogeneity, pH, non-greasy, and no symptoms of phase separation during the research period. Stability properties of the produced lotion, such as visual appearance, nature, viscosity, and scent, did not change significantly during the study time.

Keywords: Allium sativum, Phyllanthus emblica Antimicrobial, Formulation, Evaluation, etc.

A R T I C L E I N F O: Received; 20 Feb 2022 Review Complete; 25 March 2022 Accepted; 10 April 2022 Available online; 15 April. 2022

Cite this article as:

Raj M, Vyas GK, Dr. Sharma S, Sharma A, Phyto Analysis, Formulation, And Evaluation Of Herbal Lotion Produced From Allium Sativum And Phyllanthus Emblica Alcoholic Extracts, Asian Journal of Pharmaceutical Research and Development. 2022; 10(2):37-43. **DOI:** http://dx.doi.org/10.22270/ajprd.v10i2.1120

***Address for Correspondence:**

School of Pharmaceutical Studies, Faculty of Health Sciences, Dr. K. N. Modi University, Newai, Rajasthan

INTRODUCTION

Herbal plants are a valuable source of traditional and contemporary medicine, and they are beneficial to the primary health care system. Because of the ease of access, broad surface area, extensive exposure to the circulatory and lymphatic networks, and protective nature of the therapy, drug delivery through the skin is an appealing notion [1]. Herbal plants have the potential to produce secondary metabolites such as steroids, phenolic compounds, flavonoids, alkaloids, and so on. Many disorders are treated with these secondary metabolites. Amla is a member of the Euphorbiaceae family and has antiviral, antibacterial, and anticancer effects [2]. Emblica officinal is is revered in Ayurveda, India's ancient system of healing. Flavonoids, ascorbic acid, gallic acid, alkaloids, and hydrolysable tannins are the main antimicrobial principles in Emblica officinal is [3].All components of the plant, including the fruits, seeds, leaves, roots, bark, and flowers, are utilized in various formulations in ancient Indian medicine. Leaves have been utilised for anti-inflammatory and antipyretic therapy since ancient times. Because of the widespread use of antimicrobial medications to treat infectious illnesses in the contemporary period, harmful bacteria have acquired resistance to current antibiotics. As a result, several of the active chemicals, either alone or in combination, inhibit the development of disease-causing microorganisms [4]. Plants have always been a valuable source of natural materials used to preserve human health, particularly in recent decades with more thorough research into natural remedies.There is an ongoing and pressing need to develop new antibacterial agents with diverse chemical structures and novel modes of action for emerging and recurring infectious illnesses.

It is ample reason to look for alternate solutions to these problems, including medicinal herbs. Traditional herbal medications, such as garlic, provide an intriguing and undiscovered source for antiacne development (Allium sativum). Garlic is used in Indonesia to treat hypertension,

asthma, cough, common cold, headache, jaundice, haemorrhoids, constipation, ulcers, bruises, abscesses, insect bites, sleeplessness, and as an antibiotic, carminative, expectorant, and sedative [5]. Garlic includes sulphur-containing chemicals including allicin, alliin, ajoene, diallyl sulphide, dithin, S-allyl cysteine, as well as non-sulphur-containing substances like vitamin B, proteins, minerals, saponins, and flavonoids [6].

Garlic inhibits the growth of E. coli, Bacillus subtilis, Pseudomonas fluorescens, Serratia marcescens, Citrobacter freundii, Klebsiella pneumoniae, Staphylococcus aureus, and Proteus vulgaris[7]. An article indicated that allicin, the active chemical in allium, is a phytoalexin found in garlic [8].

As a result, researchers are increasingly focusing on community medicines in quest of fresh leads to build better therapies against microbial illnesses. Considering that Allium sativum and Emblica officinalis extracts have broad range antibacterial action. The study's goal was to demonstrate that Allium sativum and Emblica officinalis both had excellent antibacterial activity when manufactured as lotion for topical application alcoholic extract of Allium sativum and Emblica officinalis.

MATERIALS AND METHODS

Plant collection and authentication are the first steps in the preparation process. According to my study objectives, this procedure progresses through extraction and finally chemical analysis. The preparation is then developed into a formulation and evaluated.

Plant collection

Phyllanthus emblica Plant fruits were collected from my university campus Dr. K. N. Modi University, Newai, Rajasthan. Allium sativum bulbs were also collected from the nearby farmers in the month of November 2021.

Figure 1: Phyllanthus emblica and Allium sativum Fruits with their origin

Plant Authentication

Both plants were identified firstly with farmers then my guide Mr. Girish Kumar Vyas after that agriculture department of Dr. K. N. Modi University, Newai assured that these were the same plants am looking for. After these confirmations a letter was issued for authentication to Rajasthan University, Jaipur, Rajasthan. It was Identified there by herbarium department.

Required material

Ferric chloride, glacial acetic acid, dilute ammonia solution, concentrated sulfuric acid, chloroform, Fehling's A and B solution, sodium picrate solution, biuret's reagent (purchased from R. S. Enterprises, Jaipur, Rajasthan).Electric mixer, Soxhlet apparatus, Rotary evaporator, beakers, muslin cloth, weighing scale, test tubes, test tube holder, digital water bath are among the equipment used.

Preparation of extract

Using an electric mixer, dried fruits of each (50grams) were crushed with the separated shells to make a coarse powder. This was then placed in a muslin bag and treated to Soxhlet extraction with ethanol (90 percent) as the solvent for 24 hours at 65^{o} C. The rotary evaporator with a standard temperature of 45^{o} C was used to remove the solvent from the Ethanolic Extract of A. S. and P. E. fruits [12].

Figure 2: Soxhlet Extraction of Allium Sativum

Phyto Analysis

Phytochemical analysis of petroleum ether, chloroform, ethyl acetate and methanol extract of the screened plants were done for the presence or absence of active secondary metabolites or different constituents such as tannins, alkaloids, flavonoids, terpenoids, steroids, carbohydrates, proteins and saponins. The dried extract was reconstituted in methanol and subjected to standard phytochemical analysis following the procedures of referred article[9].

Formulation of lotion

To avoid water and oil phase separation, the lotion was made by rapidly mixing the non-polar phase into the polar phase. The non-polar phase was first melted together and then gently added to the hot polar phase combination. The following formula was used for the preparation because P. E. has qualities that are compatible with water and A. S. has features that are compatible with oil phase[17].Contents according to phase are given hereunder;

Figure 3: Formulation of lotions

Table1: Chemical composition of formulation in percentage

Sr. No.	Component	Function	F1 Content % (w/w)	F2 Content % (w/w)
1.	Extractof A.S. fruits	Antimicrobial	1	1
2.	Extractof P. E. fruits	Antimicrobial	1	1
3.	Bentonite	Thickening agent	2.5	2.5
4.	Methyl Paraben	Preservative	0.05	0.05
5.	Glycerine	Humectant	1.5	1.5
6.	Triethanolamine	Neutralizer	0.45	0.45
7	Water	Diluent	38.9	38.2
8	Cetyl Alcohol	Co-emulsifier	1.5	2
9	Stearic Acid	Emulsifier	0.60	0.80
10	Coconut oil	Occlusive	2.5	2.5

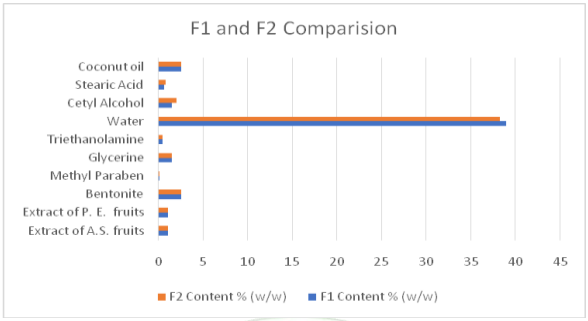


Figure 1: Composition of extracts in Herbal lotion formula

Evaluation of Pharmaceutical parameters of lotion

Preliminary Pharmaceutical evaluation of the prepared lotion formulations was carried out as follows:

PH:A digital pH metre was used to determine the pH of the lotion. A 10% lotion solution was made, and the solution was submerged in a pH meter, where the pH was measured and recorded[10].

Viscosity: The LV-64 spindle was used to measure viscosity in a Brookfield viscometer. The speed of rotation was changed to 25 RPM. The viscosity of the prepared lotion was determined by directly immersing it in the spindle [11-12].

Spreadability: The parallel plate method was used to test the spreadability of lotion. Two 20/20 cm glass slides were chosen. One of the slides was covered with around 1 g of the lotion mixture. The other slide was placed on top of the lotion, sandwiching it between the two slides, and a 125 g weight was placed on the upper slide, pressing the lotion evenly between the two slides to produce a thin layer. The spread diameter was measured when the weight was removed [13].

Spreadability was calculated by following formula [16]

$S=M\times L/T$

Here,

S= Spreadability

M= Weight tide to the upper slide

L= Length of glass slide

T= Time taken to separate the slides

Stability Test: The formulated lotion was stored at different temperatures and humidity conditions of 25±2 °C / 60±5% RH (at room temperature), 40±2 °C / 75±5% RH (accelerated temperature) for a period of three months and studied for pH, viscosity and spreadability [14].

Sensitivity Test: A portion of lotion was applied on the forearms of 6 volunteers and left for 20 minutes. After 20 minutes any kind of irritation if occurred was noted [15].

Washability Test: A portion of lotion was applied over the skin of hand and allowed to flow under the force of flowing tap water for 10 minutes. The time when the lotion completely removed was noted. Appearance: The colour, odour and homogeneity of the lotion were visually determined.

RESULTS AND DISCUSSIONS

As the objective of the present study was to formulate and evaluate formulations of lotion from ethanolic extracts of Allium sativum and Phyllanthus emblica fruits and evaluate the efficacy with different quality determination tests.

Preparation of extract:

Dried fruits (50 gram) were placed in a muslin bag and treated to Soxhlet extraction using ethanol (90 percent), and the yield were obtained given in Table No. 2 [12].

Table 2: Extraction yield of both plants in Alcohol (90%)

S. No.	Crude drug quantity Taken	Yield Obtained
1.	Allium sativum 75 Grams	8 grams
2.	Phyllanthus Emblica 75 Grams	5grams

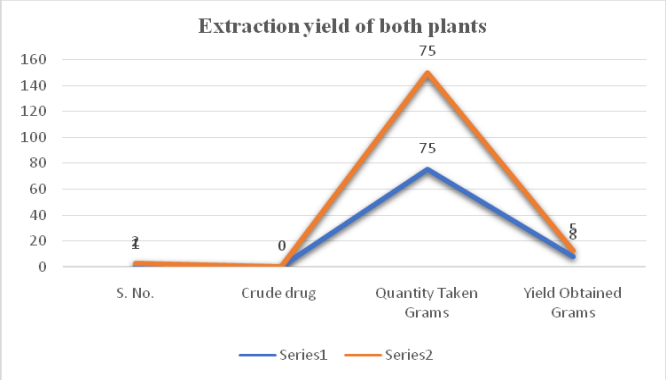


Figure 2: Extraction yield of both plants

Phyto Analysis

Qualitative phytochemical assays were used to evaluate the presence of phytochemical elements in the test material.The presence and absence of alkaloids, glycosides, phenolic compounds and tannins, saponins and flavonoidswas confirmed in the alcoholic extract of Allium sativum and Phyllanthus emblica fruits.

Both plants are rich sources of phytoconstituents systemic procedure confirmed the presence of alkaloids, glycosides, phenolic compounds and tannins, saponins and flavonoids in both extracts. Only quinones found present in extracts of Phyllanthus emblica and absent in extract of Allium sativum.

Table 3: Phyto Analysis of A. S. and P. E. extracts

Sr. No.	Phytochemicals	Ethanolic Extract of Phyllanthus Emblica	Ethanolic Extract of Allium sativum
1	Alkaloids	Present	Present
2	Flavonoids	Present	Present
3	Tannins	Present	Present
4	Quinones	Present	Absent
5	Monoterpenes and sesquiterpenes	Present	Present
6	Saponins	Present	Present
7	Tannins	Present	Present

Results of Evaluation parameters of lotion

The current investigation was carried out to prepare and assess formulations. The herbal extracts were produced using the Soxhlet method. The physicochemical characteristics were investigated, and the findings for spreadability, extrudability, washability, solubility, loss on drying, and other qualities were found to be good.

Table 4: Preliminary investigation comparative results

S. No.	Characteristics	Formulation 1	Formulation 2
1	Colour	Greenish yellow	Greenish yellow
2	Odour	Characteristic	Characteristic
3	Viscosity (<10000) cps	8425	7555
4	P^H (4-7)	5.20	6.11

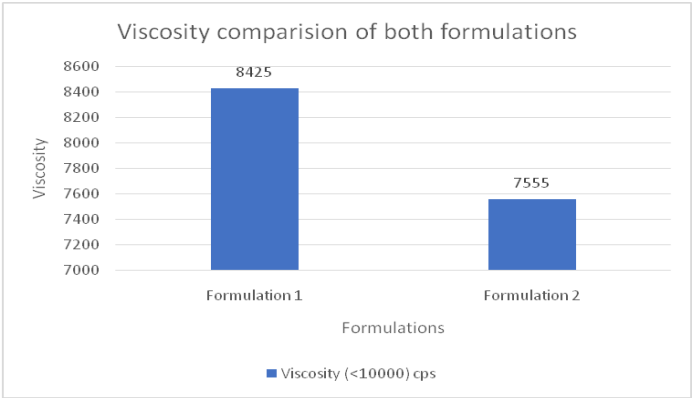


Figure 3: Viscosity comparison of both formulations

Viscosity of a lotion is always acceptable in the range of <10000 cps. But stability study of formulation 1 is found more satisfactory than formulation 2.

Table 5: Results of Evaluations of lotion formulations

S. No.	Characteristics	Formulation 1	Formulation 2
1	Spreadability (cm)	8.4	8.5
2	Loss on drying	0.2%	0.3%
3	Solubility	Soluble in boiling water, miscible with alcohol, ether, chloroform	Soluble in boiling water, miscible with alcohol, ether, chloroform
4	Washability	Easily washable with normal water	Easily washable with normal water
5	Irritancy	Non-Irritable	Non-irritable
6	Stability study	Stable on 3-month study	Stable on 3-month study

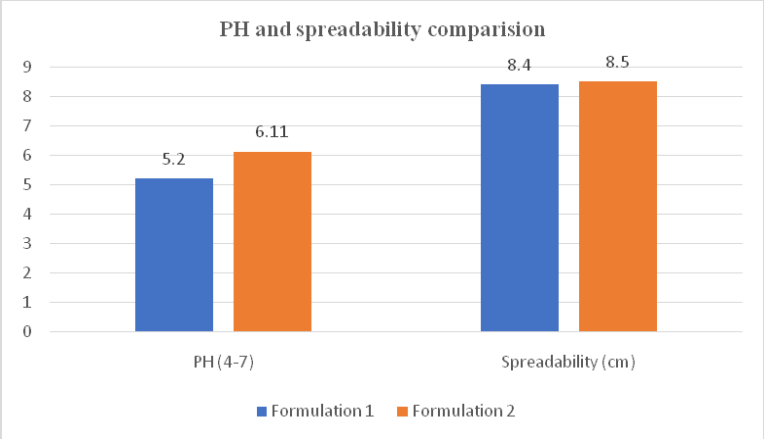


Figure 4: Comparison of PH and spreadability of Both formulations

In addition, the formulations were tested for stability for four weeks to three months at various temperatures, including $(25+2)^0$C and $(40+2)^0$C. In terms of viscosity, PH and spreading ability, diffusion research, and irritating impact, no differences were discovered.

As a consequence, some experimental results for the development and assessment of the herbal plant extracts Allium sativum and Phyllanthus emblica are shown above. The findings were deemed satisfactory in overall. For this objective, several animal-related research methodologies will be used in the future. This is my perspective for the future on the subject.

CONCLUSION

The current study suggests that extraction of Allium sativum and Phyllanthus emblica is required in order to generate better, safer, and more cost-effective antibiotics to treat bacterial illnesses. This study shows that the active ingredients in Allium sativum and Phyllanthus emblica are various types of phytochemicals, which create good antibacterial activity and have a great potential as an antibacterial agent. Other researchers have already made similar assertions. It might explain the observed efficacy in the traditional use of the plant in the treatment of common skin problems when prepared as a topical lotion. Allium sativum and Phyllanthus emblica herbal lotion have antibacterial effects. For my future studies, I'll do additional research on this.The completed product was easy to distribute on the skin's surface, didn't irritate the skin, dispersed well, and was stable at all temperatures. Animal studies on phytochemical and pharmacological concerns are also required. It would be simple to develop new formulas with continuous research.

REFERENCES

1. Sukanya MK, Shimi, Aruna SR. Phytochemical Analysis Antimicrobial Analysis Antimicrobial careening and Anthelmintic properties Of Phyllanthus emblica. International Journal of Pharma and Bio Sciences. 2013; 4(4):55-64
2. Jadon R, Dixit S. Phytochemical extraction and antimicrobial activity of some medicinal plants on different microbial strains. Journal of Medicinal Plants Studies. 2014; 2(3):58-63.
3. Varghese LS, Alex N, Ninan MA, Soman S, Jacob S. Evaluation of in vitro antibacterial activity whole plant (fruits, seeds, stem, leaves and roots) of Emblica officinalis gaertn. International journal of ayurvedic and herbal medicine. 2013; 3(6):1420-1425.
4. Maji S, Dandapat P, Ojha D, Maity C, Halder SK, Das PK et al. In vitro antimicrobial potentialities of different solvent extracts of ethnomedicinal plants against clinically isolated human pathogens. Journal of Phytology. 2010; 2(4):57-64.
5. Ministry of Health of Republic Indonesia. Materia Medika Indonesia. Jakarta: Direktorat Jenderal Pengawasan Obat Dan Makanan; 1995
6. Ross ZM, Maslin DJ, Hill DJ. The effect of steam distilled garlic oil on lactic acid and other enteric bacteria. FEMS Microbiol Rev 2000; 12:137-42.
7. Mishra N, Behal KK. Antimicrobial activity of some spices against selected microbes. Int J Pharm Pharm Sci 2010; 2(3):187-96
8. Kodera Y, Ichikawa M, Yoshida J, Kashimoto N, Uda N, Sumioka I, et al. Pharmacokinetic study of allixin, a phytoalexin produced by garlic. Chem Pharm Bull (Tokyo) 2002; 50(3):354-63.
9. Harborne JB. Phytochemical Methods, Chapman and Hall Publications, London, (1998); 7-8.
10. Namita and Nimisha. Development and evaluation of herbal cosmeceutical for skin care. International Journal of Pharmacological and Biological Sciences 2013; 4(2):86-92.

11. Kumar, K. K., Sasikanth, K., Sabareesh, M. and Dorababu, N. Formulation and Evaluation of Diacerin Cream. Asian Journal Pharmaceutical Clinical Research 2011; 4(2):93- 98.
12. Neuwald, F. Rheological studies of new cream bases with the Brookfield Synchroelectric viscometer, Journal of the society of cosmetic Chemists. 1966; 17: 213-233.
13. Garg, A., Aggrawal, D., Garg, S. and Singla, A. K. 2002. Spreading of Semisolid Formulation an update. Pharmaceutical Technology 84:102.
14. Negi, A., Sharma, N. and Singh, M.F. Formulation and Evaluation of an Herbal Anti-Inflammatory Gel Containing Eupatorium Leaves Extract. Journal of Pharmacognosy and Phytochemistry 2012; 1(4):112-117.
15. Draize, J., Woodard, G. and Calvery, H. 1944. Methods for the study of irritation and toxicity of substances applied topically to the skin and mucus membranes. Journal of Pharmacology and experimental Therapeutics 82: 377-390.
16. Panicker, p. S., &manjusha, m. P. Preparation and evaluation of polyherbal coldcream. Journal of pharmacognosy and phytochemistry, 2021; 10(1):1708-1710.
17. Gyawali, R., Paudel, N., Shrestha, S., &Silwal, A. Formulation and evaluation of antibacterial and antioxidant polyherbal lotion. *Journal of Institute of Science and Technology*, 2016; *21*(1):148-156.