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# FORMULATION AND EVALUATION OF HERBAL OINTMENT BY GUAVA LEAF EXTRACT

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## 1. ABSTRACT

This study focused on formulating and evaluating a herbal ointment using guava (*Psidium guajava*) leaf extract, known for its antibacterial, antifungal, anti-inflammatory, and antioxidant properties. Fresh guava leaves were collected, dried, powdered, and subjected to ethanol extraction. The resulting extract was incorporated into a natural ointment base consisting of lanolin, paraffin, alcohol, and petrolatum jelly. The prepared ointment was assessed for key physical parameters such as color, texture, fragrance, spreadability, pH, and stability under ambient conditions. It was also tested for its wound-healing and infection-preventing properties. Results indicated that the ointment had a smooth texture, pleasant scent, skin-friendly pH, and remained stable over time. It showed effective wound-healing activity and proved beneficial for treating minor skin conditions such as cuts, rashes, and infections. The study concluded that guava leaf extract is a safe, cost-effective, and natural alternative to chemical-based ointments, with promising applications in herbal medicine and skincare.

**KEYWORDS:** Herbal ointment, Guava leaf, Evaluation parameter.

## 2. INTRODUCTION

Herbal medicine has garnered significant attention as an alternative to synthetic pharmaceuticals, particularly due to its natural origins, reduced side effects, and sustainability. Among the various plants with medicinal benefits, Psidium guajava (guava) has long been celebrated in traditional medicine systems for its wide range of therapeutic properties.

Although the fruit is widely recognized for its rich vitamin C content, it is the leaves of the guava plant that have attracted increasing interest for their unique health benefits.

**Fig. 1: *Psidium guajava.***

Guava leaves contain several bioactive compounds, including flavonoids, tannins, and polyphenols, which contribute to their medicinal value. These compounds are known for their anti-inflammatory, antioxidant, and wound-healing properties, making guava leaves a valuable natural resource in treating skin ailments. Traditionally, guava leaves have been used to address skin issues such as rashes, minor cuts, and irritation, as well as to promote general skin health. In addition, guava leaves have been reported to possess properties that support digestion, cardiovascular health, and overall well-being, further elevating their importance in herbal therapies.

Ointment formulations like ointments are a common method of delivering these therapeutic compounds to affected areas of the skin. Ointments, being easy to apply and highly effective at localizing the treatment, are ideal for addressing skin irritations and promoting the healing of minor wounds. This study focuses on the formulation of a guava leaf-based herbal ointment, utilizing ethanol-extracted active compounds incorporated into a base of natural ingredients such as lanolin, paraffin, and petrolatum jelly.

The formulation will undergo various evaluations, including assessments of physical characteristics such as texture, spreadability, and pH stability, as well as its ability to support wound healing. This research seeks to provide a scientific validation of guava leaf extract's potential as a safe, natural, and effective ingredient in skincare applications.

## 3. MATERIALS AND METHODS

### 3.1.1 Collection of plant

The plants were collected from the JIGYASA UNIVERSITY School of Pharmaceutical Sciences, dried, purified, and stored until further use.

**Fig. 2: Dried Guava Leaf.**

### 3.1.1 Preparation of Guava Leaf Extract

The leaves were removed, thoroughly cleaned in distilled water, and left to dry in the shade for a few days. We ground the dried leaves into a powder. 350 ml of 90% ethanol was infused with 100 gm of powder for 4 hr in the Soxhlet extraction method. At last, the ethanolic extract was gathered and concentrated to produce a somewhat green residue. The extract was kept in a cool, dark place in an airtight container.

**Fig. 3: Extraction Process.**

### 3.2 Preliminary phytochemical studies

Plants serve as biosynthetic laboratories for various chemical substances with physiological effects. Preliminary phytochemical screening identifies plant components, including alkaloids, flavonoids, tannins, and saponins, potentially indicating therapeutic potential for medications.

**(a) Test for alkaloid**

The emergence of a green-coloured or white precipitate after adding strong hydrochloric acid to 2 ml of plant extract and then adding Mayer's reagent in small quantities shows the presence of alkaloids.

**(b) Test for Glycosides**

The development of a pink colour after mixing 2ml of plant extract with 3ml of 10% ammonia solution signifies the presence of glycosides.

**(c) Test for Carbohydrates**

The appearance of a purple or crimson colour after adding Molisch’s reagent and adding a few drops of strong sulphuric acid to 2ml of plant extracts denotes the presence of carbohydrates.

**(d) Test for saponins**

2 ml of 5% ferric chloride and 1 ml of plant extract were mixed. When dark blue or greenish-black formation takes place, tannins are present.

**(e) Test for Tannins**

The production of a dark blue or almost green colour when mixing 1 ml of plant extract with 2 ml of 4% ferric chloride signifies the presence of tannins.

**(f) Test for flavonoids**

Sodium Hydroxide test- If flavonoids are present, a yellow color is seen in the sodium hydroxide-treated filtrate after the extract has been dissolved in water. Sulfuric acid test- If you add a drop of concentrated sulfuric acid to the aforementioned, the yellow color will vanish.

**(g) Test for Steroids**

To 1 ml of plant extract, add an equal volume of chloroform and a few drops of strong sulphuric acid. A brown ring forms, signaling the presence of steroids.

**(h) Test for Terpenoids**

1ml of plant extract and 2 ml of 4% ferric chloride were combined. Tannins are present when a greenish black or dark-blue formation occurs. Terpenoids are present when a blue-green colour forms.

**(i) Test for amino acid and protein**

Biuret Test- After adding 2 ml of 10% sodium hydroxide solution and stirring, add 2-3 drops of 1% copper sulfate solution to the 2 ml of extract. Protein is proven to be present by observation of violet or purple coloration. Ninhydrin Test- Add 0.5 ml of ninhydrin solution to 2 ml of extract. Boil for 2 min, then let it cool. If a blue hue shows up, proteins are present.[5]

### 3.3 Formulation of ointment

Ointment formulation refers to the process of developing a semisolid preparation that is applied to the skin or mucous membranes for therapeutic purposes. Ointments are designed to deliver active ingredients, such as antibiotics, antifungals, or soothing agents, to a specific site on the body to provide local treatment for various conditions, such as infections, skin irritations, or inflammatory diseases.

An ointment is typically a combination of active ingredients (which provide the desired therapeutic effect) and excipients (inactive substances that serve as a vehicle for the active compounds). The key characteristics of an ointment formulation are its consistency, spreadability, stability, and the ability to effectively release the active ingredient at the site of application.

**Table 1: Formulation of ointment base.**

| S. No. | Names of Ingredients | Quantity to be taken |
|---|---|---|
| 1 | Lanolin | 0.7 |
| 2 | Cetostearyl alcohol | 0.5 |
| 3 | Hard Paraffin | 1.5 |
| 4 | Petrollium Jelly | 7.3 |

### 3.4 Formulation of Herbal Ointment

Guava (*Psidium guajava*) leaves have been traditionally used in various cultures for their medicinal properties, particularly for their antibacterial, anti-inflammatory, and antioxidant effects. These leaves are rich in bioactive compounds like flavonoids, tannins, essential oils, and alkaloids, which contribute to their therapeutic properties. The formulation of a herbal ointment using guava leaf extract can offer an effective and natural remedy for treating skin infections, wounds, rashes, and other dermatological conditions.

In this section, we will explore how to formulate a herbal ointment using guava leaf extract, covering the essential steps, ingredients, and key factors involved in the process

**Table 2: Formulation of Herbal Ointment.**

| S. No. | Name of Ingredient | Quantity to be taken |
|---|---|---|
| 1 | Prepared guava leaf extract | 10gm |
| 2 | Ointment base | 10gm |

### 3.5 Procedure for the preparation of herbal ointment

a) First, hard paraffin was finely ground and weighed to create the ointment base. This was then put in an evaporating dish over a water bath. Once the hard paraffin has melted, any leftovers. After adding the ingredients and gently stirring to help with the melting and homogeneous mixing, the ointment base was cooled.

b) Using the levigation method, precisely weighed guava leaf extract was combined with the ointment base to create a smooth paste that was two or three times its The ointment was homogenous, and then transferred it into an appropriate container.[4]

### 3.6 EVALUATION OF HERBAL OINTMENT

The following physical-chemical parameters were used to assess the herbal formulation

#### 3.6.1 Color and Odour

Visual inspection was used to assess color and odor.


**Fig. 4: Colour of ointment.**

#### 3.6.2. Loss on drying

The ointment was placed in a Petri dish in a water bath and dried until a constant weight was reached to calculate the loss on drying.

#### 3.6.3 pH

The formulation’s pH was measured with a digital pH meter. The sample's weighted quantity was dissolved in distilled water and kept for two hours. Three pH measurements were made, and the average results were taken into account.

#### 3.6.4. Spread ability

The spreadability was measured as the amount of time, in seconds, that it took for two slides to separate from the ointment that was positioned in between them under the path of a specific load. Spread ability was computed using the

following formula. S = (M.L/T), where M =weight attached to the upper slide, L = length of the glass slides, and T = amount of time needed to separate the slides.

### 3.6.5. Diffusion

An agar nutrient medium with a known concentration was prepared to conduct the diffusion study. After being poured into a petri dish, it was left to set. The prepared formulation was inserted into the Petri dish after a hole was bored through its centre. It was noted how long it took for the ointment to diffuse.

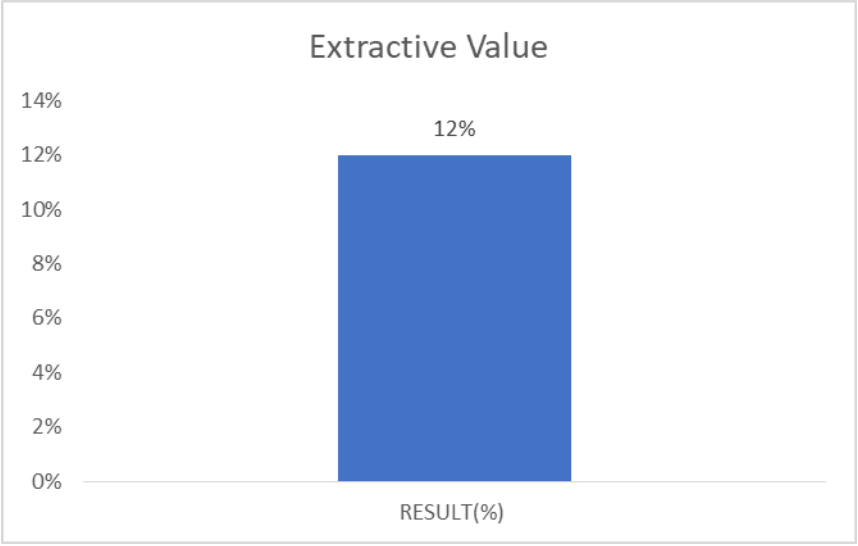
## 4. RESULT

The goal of the current study was to formulate and assess the herbal ointment. To achieve this, the herbal extracts were made using a straightforward maceration method. Strong extract yield with no negative effects on the chemical components' activity. The ointment was made using the levitation method, which ensured that the herbal extract and ointment base were uniformly mixed and stable throughout storage. After examining the physicochemical characteristics, satisfactory findings were obtained for spreadability, extrudability, washability, solubility, loss on drying, and other factors.

**Fig. 5: Trituration process of guava powder.**

### 4.1 Extractive value of guava leaf

The percentage yield of guava leaf extract using ethyl acetate was **12%.**



### 4.2 Preliminary phytochemical studies

Guava leaves (Psidium guajava) are frequently the subject of preliminary phytochemical investigations to find the existence of bioactive chemicals that may be in charge of their therapeutic qualities.

**Table 3: Preliminary Photochemical Studies.**

| S. No. | Chemical Test | Hydroalcoholic Extract | Methanol |
|---|---|---|---|
| 1 | Test for Steroids | + | - |
| 2 | Test for Saponins | + | + |
| 3 | Test for alkaloids | + | + |
| 4 | Test for Glycosides | + | + |
| 5 | Test for Reducing Sugar | - | - |
| 6 | Test for Tannins | - | + |
| 7 | Test for Flavonoids | + | - |
| 8 | Test for Amino acids | + | - |
| 9 | Test for Carbohydrates | + | - |

### 4.3 Physical properties of ointment

The formulated herbal ointment is evaluated for its physical properties, including color, odor, and state, confirming a semisolid, yellow texture and uniform distribution of extract.

**Table 4: Physical properties of herbal ointment.**

| S. No. | Specification | Limit |
|---|---|---|
| 1 | State | Semi Solid |
| 2 | Colour | Greenish |
| 3 | 0dour | Characteristics |
| 4 | Texture | Smooth |

### 4.4 Determination of pH

The ointment's pH was found to be between 5 and 6.5, which is a good range for the pH of the skin. Every herbal ointment formulation had a pH that was close to what was needed for the skin. For example, F3-6.2 shows pH values that are close to skin pH.

**Table 5: Determination of pH**

| S. No | Formulation | pH |
|---|---|---|
| 1 | F | 6.2 |

### 4.5 Determination of Spreadability

The spreadability plays a considerable role in patient compliance and ensures uniform application of ointment to a large area of the skin. The low value of the spreadability coefficient of the ointment was sufficient, suggesting easy spreading. The lower value of spreadability indicates the lesser work required to spread the ointment over the skin. This means formulation was easily spreadable by applying a small amount of shear. The spreadability test showed that the formulation has good spreadable properties.

**Table 6: Determination of Spreadability.**

| S. No. | Formulation | Spread ability |
|---|---|---|
| 1 | F1 | 26.5sec |

### 4.6 Physicochemical evaluation of formulated ointment

Physicochemical evaluation of a formulated ointment made from guava leaf extract (Psidium guajava) involves analysing several parameters to determine the quality, stability, and suitability of the formulation for topical application. Below is a standard outline of the physicochemical evaluation parameters, along with their description and purpose:

**Table 7: Physicochemical evaluation of formulated ointment.**

| Physiochemical parameters | Observation |
|---|---|
| Colour | Greenish |
| Odour | Characteristics |
| Consistency | Smooth |
| pH | 5.4 |
| Spreadability | 26.5 |
| Extrudability | 0.4 |
| Diffusion study (after 60 min) | 0.7 |
| Loss on drying | 30% |
| Solubility | Soluble in boiling water, miscible with alcohol, ether, chloroform |
| Wash ability | Non irritant |
| Non irritancy | Non irritant |
| Stability study | Stability study Stable |

## 5. CONCLUSION

The current study focused on the development and evaluation of a guava leaf (*Psidium guajava*) extract-based herbal ointment as a natural, cost-effective alternative to conventional wound-healing agents. Guava leaves, long valued in traditional medicine, are rich in phytochemicals such as flavonoids, tannins, saponins, and essential oils, which contribute to their antioxidant, anti-inflammatory, and wound-healing properties. The leaves were macerated using ethanol to extract these bioactive compounds efficiently, and the presence of therapeutic constituents was confirmed through phytochemical screening.

To create a stable and effective ointment, the extract was blended into a base containing petroleum jelly, paraffin, and emulsifying wax. The formulation was assessed for spreadability, homogeneity, texture, color, and odor, with results showing high user-friendly potential and consumer acceptability. The ointment's pH (5.5–6.5) was suitable for dermal use, and it demonstrated excellent physical stability, without phase separation or microbial contamination, under varying storage conditions.

Beyond formulation, this study underscores the importance of plant-based medicine in addressing modern healthcare concerns, such as antibiotic resistance and access to affordable treatments in low-resource areas. Guava leaves are widely available and often discarded, making them an environmentally sustainable raw material for medicinal use. The research aligns with global trends favoring natural and complementary therapies and supports the WHO’s initiative to integrate traditional remedies into modern systems.

Despite promising results, the study recommends further standardization of plant material and extraction methods to ensure consistent quality. Future clinical trials and advanced molecular analysis are needed to validate the safety, efficacy, and mechanisms of action. Ultimately, guava leaf extract shows strong potential for use in dermatological care and offers a sustainable, accessible solution for global health challenges, especially in under-resourced settings.

## 6. REFERENCES


1. Krati, Dr. Martolia Jaya, et. al, A comprehensive review on in-vitro methods for anti- microbial activity, IP International Journal of Comprehensive and Advanced Pharmacology, 2024; 9(3).
2. Neeru, Shilpi Kashyap, Esha Vatsa, Jitendra Singh and Ankush Sundriyal "Determination of Total Phenolic Content, Total flavonoid Content and Total Antioxidant capacity of different extracts of Roylea elegans Wall. (aerial parts)" World journal of pharmacy and pharmaceutical sciences (WJPPS), 2016; 5(6): 1884-1891.
3. Neeru, Esha Vatsa, Jitendra Singh and Ankush Sundriyal "Pharmacognostic Standardization Parameters of Roylea elegans Wall. (Aerial Parts)" International Journal for Pharmaceutical Research Scholars (IJPRS), 2016; 5(2):133-140.
4. Kundan Singh Bora and Esha Vatsa "Pharmacognostic Evaluation of Dendrobium macraei Lindl." Universities Journal of Phytochemistry and Ayurvedic Heights (UJPAH), 2016; 1(20):29-36.
5. Amit Sharma, Bharat Parashar, Esha Vatsa, Shilpa Chandel and Surbhi Sharma "Phyto chemical screening and Anthelmintic activity of leaves of Cedrus deodara (Roxb.)" World journal of pharmacy and pharmaceutical sciences (WJPPS), 2016; 5(8):1618-1628.
6. Amit Sharma, Surbhi Sharma, Shilpa Chandel, Esha Vatsa and Dr. Bharat Parashar "A review on Morchella esculanta: Therapeutically Potent plant" World journal of pharmacy and pharmaceutical sciences (WJPPS), 2016; 5(9): 685- 699.
7. Esha Vatsa and Kundan Singh Bora "Memory Enhancing Activity of Dendrobium macraei Lindl. in Swiss Albino Mice" British Journal of Pharmaceutical Research (BJPR), 2016; 13(2):1-11.
8. Vatsa Esha, Chandel Shilpa, Parashar Bharat, Neeru "Physico-Chemical and Phytochemical Evaluation of Dendrobium macraei Lindl. (Whole Plant)" International Journal of Pharmacognosy and Phytochemical Research (IJPPR), 2016; 8(11): 1801- 1811.
9. Esha Vatsa, Mehak Aggarwal, Shipra Gautam "Formulation and Evaluation of Polyherbal Facial Scrub" Just Agriculture multidisciplinary e-Newsletter, Article ID: 023, 2021; 1(9): 1-6.
10. Shipra Gautam, Madhubala Thakur, Mehak Aggarwal, Esha Vatsa"Azadirachta indica- A Review as a Potent Anti-Diabetic drug" Just Agriculture multidisciplinary e-Newsletter, Article ID:98,2021; 1(10): 1-6.
11. Esha Vatsa, Samriti Faujdar, Nidhi Sharma, Shilpa Chandel, Mehak Aggarwal"Dendrobium macraei Lindl.: A review on medicinally potent orchid on the basis of recent evidences" Chinese Journal of Medical Genetics, 2022; 31(3): 560-571.
12. Krati, Babita Rawat, Abhishek Bhardwaj, Amandeep Singh, A Comprehensive Review on Indian Barnyard Millet (Echinochloa frumentacea), International Journal of Pharmaceutical Technology and Biotechnology, 2025; 12(1): 01-07.
13. Krati, Dr. Martolia Jaya, et. al, A Comprehensive review on in-vitro methods for antimicrobial activity" Educational administration: Theory and Practice". 2024; 30(6), 8 (2977-2984).
14. Esha Vatsa, Dr. Samriti Faujdar, Shilpa Chandel, Nidhi Chaudhary, Ashok Kumar, Neeru, "Studies on anti-inflammatory activities of whole plant of Dendrobium macraei Lindl." European Chemical Bulletin, 2023; 12(Special Issue 1): 657-664.
15. Esha Vatsa, Dr. Samriti Faujdar, Nitin Kumar, Nidhi Chaudhary, Shilpa Chandel, Neeru, Mehak Aggarwal "Current studies to justify the medicinal potential of the orchid Dendrobium macraei Lindl." European Chemical Bulletin, 2023; 12(S3): 5822-5830.

16. Divya Negi Rawat, Anjali Bisht, Esha Vatsa, Deepika Chandra, Nidhi Chaudhary, Ashok Kumar "Urinary bacterial profile and antibiotic susceptibility pattern among patients of urinary tract infections" High Technology letters, 2023; 29(10): 115-128.
17. Mehak Aggarwal, Ujjwal Nautiyal, Harmeet Singh, Esha Vatsa, Nidhi Chaudhary, Anjali Bisht, Divya Negi "Development and evaluation of drug delivery system containing luliconazole" High Technology letters, 2023; 29(11): 633-652.
18. Jagriti Gairola, Prashant Kukreti, Anjali Bisht, Divya Negi, Nidhi Chaudhary, Esha Vatsa "Development of Chronotherapeutic Delivery System for the Oral Administration of Aceclofenac for Rheumatoid Arthritis by Using Different Polymers" Journal of Chemical Health Risks, 2023; 13(6): 1180-1192.
19. Nidhi Chaudhary, Dr. Deepak Nanda, Dr. Esha Vatsa, Mithilesh Kesari, Harshita Chandra, Simran Singh Rathore "The Promise of Usefulness of the Evergreen Shrub Cassia auriculata" Journal of Advanced Zoology, 2023; 44(4): 1249-1261.
20. Ms Pooja Yadav, Dr. Esha Vatsa, Dr Arti Rauthan, "Enhancing Menstrual Awareness among Adolescent Girls: Evaluating the Influence of School Initiatives" Journal of Chemical Health Risks, 2024; 14(02): 3141-3149.
21. Mehak Aggarwal, Esha Vatsa, Nidhi Chaudhary, Shilpa Chandel, Shipra Gautam, "Formulation and Evaluation of Polyherbal Face Pack" Research Journal of Pharmacy and Technology, 2024; 17(6): 2481-2485.
22. Esha Vatsa, Mehak Aggarwal, Nidhi Chaudhary, Shipra Gautam, Neeru, Nitin Kumar, "Comparison Based on Pharmacognostical and Pharmacological Profile of Thuja Orientalis Linn. And Thuja Occidentalis Linn.: A Review" Naturalista Campano, 2024; 28(1): 3208-3219.
23. Priya Pandey, Esha Vatsa, Gaurav Lakhchora, Md Shamsher Alam, Niyaz Ahamad Ansari, Mohammad Dabeer Ahamad, Sarafarz Ahamad, Mukul Singh, Nitin kumar, "Nano Medicine Advancements in Addressing Rare Neurological Disorders: A Focus on Globoid Cell Leukodystrophy (Krabbe's Disease) Treatment" African Journal of Biological Sciences, 2024; 6(3): 2654-2684.
24. Esha Vatsa, Nidhi Chaudhary, Priya Khadwal, Mehak Aggarwal, Tanya Aggarwal, and Nishant Bhardwaj, "In vitro Antidiabetic Effect and Phytochemical Screening of Cassia biflora Mill." Indian Journal of Natural Sciences, 2025; 15(88): 87726-87733.
25. Anil Kumar, Dr. Esha Vatsa, "AI-Powered Embryo Selection is revolutionized: A Review" South Eastern European Journal of Public Health, 2025; XXVI (1): 6223-6230.
26. Lohani, V., A R, A., Kundu, S., Akhter, M. Q., & Bag, S. Single-Cell Proteomics with Spatial Attributes: Tools and Techniques. ACS omega, 2023; 8(20): 17499–17510. https://doi.org/10.1021/acsomega.3c00795.
27. Amandeep Singh, Deepak Nanda, Ashok Kumar and Abhishek Bhardwaj . In vitro evaluation of anti-inflammatory activity of ageratum conyzoides leaves by Human Red Blood Cell (HRBC) membrane stabilization method, International Journal of Research in Pharmaceutical and Nano Sciences, 2023; 12(6): 196-202.
28. Amandeep Singh, Deepak Nanda, Ashok Kumar, Abhishek Bhardwaj. In vitro evaluation of anti-inflammatory activity of ageratum conyzoides leaves by Human Red Blood Cell (HRBC) membrane stabilization method, International Journal of Research in Pharmaceutical and Nano Sciences, 2023; 12(6): 196-202.
29. Singh A, Nanda D, Bhardwaj A, Kumar A. A pharmacological investigation for therapeutic potential of Callistemon citrinus as an anthelmintic agent (Bottle-Brush Plant). IP Int J Comprehensive Adv Pharmacol, 2024; 9(3): 206-210.

30. Yogesh Tiwari, Amandeep Singh, Bhupendra Kumar, Ashok Kumar. “In Vitro Evaluation of Alpha Amylase Activity of Bark Extracts of Ficus Auriculata”. International Journal of Innovative Science and Research Technology. December, 2017; 2(12): 88-92.
31. Bhupendra Kumar, Amandeep Singh, Yogesh Tiwari, Ashok Kumar. UV PROTECTIVE ACTIVITY OF GLYCINE MAX SEEDS. Indian Research Journal of Pharmacy and Science, 2017; 15: 1190-1195
32. Reena Bhatt, Ashok Kumar, Ankita Sharma. FORMULATION AND EVALUATION OF SHAMPOO FORMULATED BY GLYCINE MAX SEEDS. Indian Research Journal of Pharmacy and Science; 15(2017)1232-1238
33. Kumar A, Nanda D and Gupta A. “A Prospective Study on the Risk Determinants and Economic Burden ofAdverse Drug Reactions in Tertiary Care Hospital”. Indian Journal of Natural Sciences, 2025;15(88): 87957-87961
34. Ashok Kumar, Deepak Nanda and Abhishek Gupta A holistic approach to adverse drug reactions in hospitals: Classification, risk factors, assessment and economic evaluation- A review. J. Exp. Zool. India, 2024; 27: 2337-2348. DOI: https://doi.org/10.51470/jez.2024.27.2.2337
35. Sakshi Garg, Ashok Kumar, Varsha Deva, Preeti Biswas, Harsh Rastogi, Heena Farooqui. Immediate-Release Drug Delivery System, Current Scenario, And Future Perspective-A Narrative Review. Jundishapur Journal of Microbiology, 2022; 15(1): 6509-6519
36. Ashok Kumar, Deepak Nanda, Abhishek Gupta Pattern of Adverse Drug Reactions and Their Economic Impact on Admitted Patients in Medicine Wards of a Tertiary Care Hospital. Library Progress International, 2024; 44(4): 1120-1139.
37. Alisha Rawat, Meenakshi Sajwan, Yamini Chandola,Nidhi Gaur “Assaultive role of thiamine in coalition with selenium in treatment of liver cancer”, Journal of emerging technologies and innovative research, 2022; 9(1); 2349-5162.
38. Ghildiyal, P., Bhatt, A., Chaudhary, N., Narwal, S.,Sehgal, P. “Study of various biochemical parameters on atrazine induced glucose-6-phosphate dehydrogenase deficiency in brain” International Journal of Health Sciences, 2022; 6(S7): 2552-2558.
39. Alok Bhatt, Arun Kumar, Pallavi Ghildiyal, Jyoti Maithani, Nidhi Chaudhary, Manish Nawani, Sonia Narwal “Phytochemical Profile of Melissa parviflora Benth” Neuro Quantology, 2022; 20(9); 2426-2428.
40. Palika Sehgal, Alok Bhatt, Sonia Narwal, Deepak P. Bhagwat, Nidhi Chaudhary et.al Formulation Characterization Optimization and In Vitro Evaluation of Aceclofenac Topical Emulgel, Neuro Quantology, 2022; 20(14): 1-09.
41. Sneha Rawat, Praveen Kumar Ashok, Abhishek bhardwaj “A review on Oro dispersible Tablet of Telmisartan” Org-Journal of Emerging Technologies and Innovative research (JETIR), May 2023; 10(5):i104-i112.
42. Jaison Varghese, Nitin kumar, Sapna Chaudhar, Abhishek Bhardwaj(2024) “Comparative In-Vitro Antioxidant and Antimicrobial Potential of Some Medicinal Plants”African Journal of Biological Sciences, https://doi.org/10.48047/AFJBS.6.Si3.2024.3340-3346.
43. Asima Imtiyaz, Ajay Singh, Abhishek Bhardwaj(2024) “Green synthesis of iron oxide nanoparticles from Iris kashmiriana (Mazar-Graveyard) Plant Extract its characterization of biological activities and photocatalytic activity” Journal of Industrial and Engineering Chemistry, https://doi.org/10.1016/j.jiec.2024.09.004.

44. Hem Chandra Pant, Bhawana Goswami, Ashok Kumar, Abhishek Bhardwaj, Shanti Rauthan and Amita pandey "A Review Paper on Bacopa monniera and Role of Artificial Intelligence (AI) in Medicinal Plant for Management and Treatment of Various Diseases" Indian Journal of Natural Sciences, 2025; 15(88): 01-10.
45. Vishwajeet Bachhar, Vibha Joshi , Ajay Singh,, M. Amin Mir , Abhishek Bhardwaj(2025)"Antibacterial, Antioxidant, and Antidiabetic Activities of TiO2 Nanoparticles Synthesized Through Ultrasonication Assisted Cold Maceration from Stem Extract of Euphorbia hirta"Nano Bioscience, https://doi.org/10.33263/LIANBS141.001.
46. Nidhi Chaudhary, "A review on: The deciduous shrub "Punica granatum" , European journal of biomedical and pharmaceutical sciences, 2016; 3(7); 2349-2388.
47. Singh Harmeet and Nidhi Chaudhary, "Evaluation of Lakshadi Guggul on experimentally induced global cerebral ischemia/reperfusion injury". World journal of Pharmacy and Pharmaceutical Sciences, 2016; 6(1); ISSN 2278-4357.
48. Nidhi Chaudhary and Harmeet Singh, "Evaluation of Punica Granatum Leaves Extract In Scopolamine Induced Learning And Memory Impairment In Mice". World journal of Pharmacy and Pharmaceutical Sciences ,6(6); 1677-1703.
49. Amandeep Singh, Pankaj Nainwal ,Deepak Nanda ,D.A. Jain, SOLUBILITY ENHENCEMENT OF PIOGLITAZONE WITH COMPLEXATION OF HYDROXYPROPYL-β-CYCLODEXTRIN, Digest Journal of Nanomaterials and Biostructures, Apr 2012 2(4): p.91-97.
50. Pankaj Nainwal Deepak Nanda, Amandeep Singh, D. A. Jain, QUANTITATIVE SPECTROPHOTOMETRIC DETERMINATION OF DOMPERIDONE TABLET FORMULATIONS USING IBUPROFEN SODIUM AS HYDROTROPIC SOLUBILIZING AGENT, Digest Journal of Nanomaterials and Biostructures, 2012; 2(4): 751 – 753
51. Deepak Nanda, Pankaj Nainwal, Amandeep Singh, D.A.Jain, REVIEW ON MIXED-SOLVENCY CONCEPT: A NOVEL CONCEPT OF SOLUBILIZATION, Deepak Nanda et al. ,Journal of Pharmacy Research, 2012; 3(2):411-413
52. Pankaj Nainwal, Amandeep Singh, Deepak Nanda, D.A.Jain, NEW QUANTITATIVE ESTIMATION OF ROSUVASTATIN BULK SAMPLE USING SODIUM BENZOATE AS HYDROTROPIC SOLUBILIZING AGENT, Journal of Pharmacy Research, 2012; 3(1): 6-8
53. Nainwal.P, Bhagla.A, Nanda.D, STUDY ON ANTIOXIDANT POTENTIAL AND WOUND HEALING ACTIVITY ON THE AQUEOUS EXTRACT OF FRUITS OF GARCINIA MANGOSTANA, IJPI's Journal of Pharmacognosy and Herbal Formulations, Volume-1
54. Pankaj Nainwal , Kapil Kalra , Deepak Nanda , Amandeep Singh, STUDY OF ANALGESIC AND ANTI-INFLAMMATORY ACTIVITIES OF THE ETHANOLIC EXTRACT ARIAL PARTS OF FUMARIA VAILLANTII LOISEL, Asian Journal of Pharmaceutical and Clinical Research, 2011; 4(1).
55. Amandeep Singh, Pankaj Nainwal , Deepak Nanda, D.A.Jain, SOLUBILITY ENHANCEMENT STUDY OF PIOGLITAZONE USING SOLID DISPERSION AS SOLUBILIZATION TECHNIQUE, International Journal of Science Innovations and Discoveries, Amandeep Singh et al., IJSID, 2011; 1(2): 95—100
56. Amandeep Singh, Pankaj Nainwal , Deepak Nanda, D. A. Jain, THE SOLUBILITY ENHANCEMENT STUDY OF PIOGLITAZONE USING DIFFERENT SOLUBLIZATION TECHNIQUIES, International Journal of Pharmacy & Pharmaceutical Sciences, 2012; 4(2).

57. Deepak Nanda, Pankaj Nainwal, Amandeep Singh, D.A.Jain, SOLUBILITY ENHANCEMENT STUDY OF DOMPERIDONE USING DIFFERENT SOLUBILIZATION TECHNIQUES, International Journal of Pharmacy and Pharmaceutical Sciences 2012; 2(3).
58. Pankaj Nainwal, Priyanka Sinha, Amandeep Singh, Deepak Nanda, D.A.Jain, A COMPARATIVE SOLUBILITY ENHANCEMENT STUDY OF ROSUVASTATIN USING SOLUBILIZATION TECHNIQUES, International Journal of Applied Biology & Pharmaceutical Technology, Oct - Dec -2011; 2(4).
59. Pankaj Nainwal , Deepak Nanda, Amandeep Singh, D. A. Jain, FORMULATION AND EVALUATION OF SOLID DISPERSION OF ROSUVASTATIN WITH VARIOUS CARRIERS ,Pharmacie Globale International Journal Of Comprehensive Pharmacy, Issn 0976-8157.
60. Pankaj Nainwal, Amandeep Singh1, Deepak Nanda, D.A.Jain, SOLUBILITY ENHANCEMENT OF AN ANTIHYPERLIPIDEMIC DRUG ROSUVASTATIN BY SOLID DISPERSION TECHNIQUE, International Journal of PharmTech Research IJPRIF ISSN : 0974-4304 , March-June 2012; 2: 3.
61. Kshitiz Agrawal, Pragati Bailwal, Amandeep Singh. Prem Saini, DEVELOPMENT OF QUALITY STANDARDS OF SUPRABHATAM CHURNA: A POLY HERBAL FORMULATION, International Journal of Pharmaceutical Research & Development,IJPRD, 2011; 4, June 2012.
62. Kapil Kalra, Amandeep Singh, Manisha Gaur, Ravindra P. Singh, and D. A. Jain, ENHANCEMENT OF BIOAVAILABLITY OF RIFAPENTINE BY SOLID DISPERSION TECHNIQUE , International Journal Of Pharmacy & Life Sciences, Kalra et al ., April, 2011; 2(4).
63. Pankaj nainwal ,Ranveer batsa, Amandeep singh, Deepak nanda, MEDICINAL PLANT STUDIES INFLUECED BY THE BIOTECHNOLOGICAL METHODS: A UPDATED REVIEW, International Journal of Pharma and Bio Sciences Apr-June-2011; 2(2).
64. Amandeep Singh, Sandhiya Pal, Prem Saini, IN- VITRO EVALUTION OF ANTI-INFLAMMATOTRY ACTIVITY OF TERMANALIA ARJUNA BARK EXTRACT, Journal of Innovative trends in Pharmaceutical Sciences,Vol-1(1): 9-12.
65. Amandeep Singh, Pramila Chauhan, Prem Saini, IN-VITRO ANTI-INFLAMMATORY EVALUTION OF HYDROALCOHALIC LEAVES EXTACT OF PINUS ROXBURGHII BY HRBC METHOD, International journal of Research in Pharmaceutical and Nano Sciences, 2013; 2(3): 268-271.
66. Amandeep Singh, Sumit Negi, Prem Saini, In Vitro Anti-Inflammatory Evaluation Of Leaves Using Hydroalcohalic Extract Of “Mangifera indica” International Journal of Pharmacy and Integrated Life Sciences, V1-(I7) PG (93-98).
67. Aman Deep Baghla, Kshitij Agarwal, Ramesh Verma and Deepak Nanda, Wound Healing Effect of the Aqueous Extract of the Leaves of Psidium guajava Linn., International Journal of chemicals and Life Sciences, 2013; 02 (03): 1104-1106.
68. Aman Deep Baghla, Kshitij Agarwal, Ramesh Verma and Deepak Nanda, WOUND HEALING EFFECT OF THE AQUEOUS EXTRACT OF THE LEAVES OF PSIDIUM GUAJAVA LINN., International Journal of chemicals and Life Sciences, 2013; 02(03): 1104-1106.
69. Bhupendra Kumar, Meenakshi Ghildiyal, Yogesh Tiwari , Deepika Chauhan, Amandeep Singh, IN-VITRO ANTI-INFLAMMATORY ACTIVITY OF GLYCINE MAX SEEDS, Indo American Journal Of Pharmaceutical Sciences, 2018; 05(02): 868-871.

70. Piyali Dey, Jyoti Pandey, Bhupendra kumar, Amandeep Singh, IN VITRO ANTHELMINTIC ACTIVITY OF BARK EXTRACTS OF ARTOCARPUS HETEROPHYLLUS, International Journal of Pharmacy & Pharmaceutical Research, 2018; 03(11): 33-40.
71. Bhupendra Kumar, Yogesh Tiwari, Amandeep Singh, Vineet Kumar, IN VITRO ANTIUROLITHIC ACTIVITY OF FICUS PALMATA LEAVES, International Journal Of Pharmaceutical Technology And Biotechnology, 2019; 6(1): 01-09.
72. Md. Daneyal Khurshid, Vivek Shukla, Bhupendra Kumar and Amandeep A Review Paper on Medicinal Properties of Phyllanthus emblica, International Journal of Pharmacy and Biological Sciences, 2020; 10(3): 102-109.
73. Mr. Dwivedi Vishal, Mrs. Nisha A Bhatt, Dr. Amandeep Singh PREPARATION AND STANDARDIZATION OF NAVKARSHIKA CHURNA, World Journal of Pharmacy And Pharmaceutical Sciences, 2020; 9(8).
74. Mitun Saha1, Mr. Bhupendra Kumar, Dr. Amandeep Singh Review Article on Various Phytochemicals and Different Medicinal Activities of Haritaki International Journal of Innovative Science and Research Technology, June 2020; 5(6).