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FORMULATION AND EVALUATION OF HERBAL HAIR DYE

Kavita[1], Simran Singh Rathore[2*], Krati[2], Dr. Amandeep Singh[3]

[1]Student, School of Pharmaceutical Sciences, Jigyasa University (Formerly Himgiri Zee University), Dehradun.

[2]Assistant Professor, School of Pharmaceutical Sciences, Jigyasa University (Formerly Himgiri Zee University), Dehradun

[3]Principal & Professor, School of Pharmaceutical Sciences, Jigyasa University (Formerly Himgiri Zee University), Dehradun.

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***Corresponding Author: Simran Singh Rathore**
Assistant Professor, School of Pharmaceutical Sciences, Jigyasa University (Formerly Himgiri Zee University), Dehradun.
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ABSTRACT

The rising demand for natural, chemical-free products has driven the development of herbal hair dyes as an alternative to synthetic colorants. This study focused on the formulation and evaluation of an herbal hair dye, which aims to provide a natural black colour while promoting overall hair health. The primary ingredients include henna (50%), which imparts an orange-red colour, and indigo (30%), which helps achieve the desired black hue. Additionally, coffee (4%) and amla (4%) were incorporated to enhance colour depth and promote hair vitality. The formulation also includes supporting herbs such as (2%), Shi kanji (2%), coffee (2%), red sandalwood (2%), and hibiscus (2%) to improve the hair's texture and prevent premature greying, hair fall, and dandruff.[1] The herbal hair dye was evaluated on blonde hair to assess its colour outcome, longevity, and safety. The formulation effectively provided a natural black shade, closely resembling that of healthy natural hair. The therapeutic benefits observed included hair strengthening, improved texture, and a reduction in dandruff. The dye showed minimal irritation or allergic reactions, confirming its safety for use on sensitive skin types.[2] Furthermore, the formulation demonstrated a protective effect against hair fall and premature greying, offering a dual-purpose solution for cosmetic and therapeutic needs.[3] However, further studies are needed to assess the formulation's effects on other hair colours and types, as well as its long-term use. A comprehensive analysis of the stability and scalability of the formulation is also recommended for commercial applications.[4] This research contributes to the growing body of evidence supporting the effectiveness of herbal hair dyes in the cosmetic industry.

KEYWORDS: Herbal hair dye, phytochemical evaluation, Molisch test, hair dye formulation.

INTRODUCTION

Hair dyeing has been a common practice for centuries, with the use of both natural and synthetic dyes. Traditionally, plant-based dyes have been utilized for their ability to colour hair[9] naturally without the harmful side effects often associated with chemical dyes. Synthetic hair dyes, despite offering vibrant colours, have been linked to various health concerns, including scalp irritation, allergic reactions, and long-term damage due to the chemicals used, such as ammonia, hydrogen peroxide, and parabens. These health risks have led to a resurgence of interest in natural alternatives.[10]

Henna (Lawsonia inermis), a well-known natural dye, has been used for centuries to impart a reddish-orange colour to hair and skin. However, henna alone is not sufficient to achieve darker shades, especially black. To address this limitation, indigo (Indigofera tinctoria) has been used in combination with henna to produce darker hues.[12]

The blending of other herbs, such as amla, coffee, ,and hibiscus, has been explored to not only enhance color quality but also improve hair health by strengthening hair follicles, preventing premature greying, and combating dandruff.[13] In addition to their colouring properties, these herbal ingredients offer various therapeutic benefits. Amla is known for its high vitamin C content, which helps prevent hair fall and promotes hair growth, while is reputed for its ability to improve scalp health[14] are commonly used for cleaning the scalp and hair without stripping away natural oils, making them ideal for sensitive skin.[15]

The purpose of this study is to formulate a natural, chemical-free herbal hair dye that provides a natural black colour while addressing hair health issues such as hair fall, greying, and scalp health. This formulation combines henna, indigo, coffee, amla,[16] and other herbs to create a balanced product that offers both cosmetic and therapeutic benefits. The dye's performance will be evaluated for its effectiveness in achieving the desired colour and its safety and efficacy on different hair types The plant henna has a natural coloring pigment used to dye skin, fingernails, hair, and textiles like leather, silk, and wool.[18] It may also be used for impermanent body art. An active ingredient in henna plants identified as "lawsone" is an orange-reddish dye that attaches to the protein keratin of human skin to color it.[19] Henna, scientifically identified as Lawsonia inermis, has long-established history of application owing to its natural dyeing properties. The chemical composition of henna comprises a cluster of organic compounds referred to as lawsone or hennotannic acid, which is accountable for the dyeing effect.[20] The henna plants leaves are the main source of these chemical constituents. The process of dyeing hair with henna involves a chemical reaction between lawsone and hair proteins. Henna powder is typically mixed with a mildly acidic liquid like lemon juice or tea, to create a paste.[27]

Natural hair dye gives our hair a natural black color without harming it. Even after repeated coloring our hair remains healthy as a result of this. Because traditional hair coloring procedures based on natural or synthetic colorants have limitations, this study aimed to develop a hair dye based on crude medicines with good coloring properties that is both safe and ready to use.[29]

The mechanism by which henna stains hair distinguishes it from chemical hair dyes which penetrate color that gradually fades as the hair grows.[30] It is important to note that the effectiveness and color outcome of henna can vary based on factors such as the quality of the henna powder, the natural color of the hair and individual differences in hair chemistry.

The henna shade ranges from intense crimson to pale orange varying according to the natural of the henna paste combination applied.[34]

Native to Indonesia, this spice found its way into global trade and cultural practices, leaving an indelible mark on various cuisines, traditions, and even beauty rituals.[37] The aromatic richness of clove, with its warm and spicy notes, has made it a staple in perfumery and aromatherapy. However, its application as a natural hair dye unveils a lesser-explored facet of this versatile spice.[39]

MATERIAL AND METHOD

Materials

S. no.	Ingredient	Quantity
1	Henna	25gm
2	Hibiscus	7gm
3	Black cumin Black seed	2gm
4	Guava	5gm
5	Clove	2gm
6	Tea	2gm
7	Coffee	2gm
8	Amla	5gm

Formulation of herbal hair dye

- **METHODS**

For the preparation of herbal hair dye we have selected different herbal ingredient such as Henna, Amla, Guava, Clove, Tea powder, Coffee, Kalonji, Hibiscus powder etc.

1. This all ingredients were collected from the authorized stores of the local market in the powder form of dye.
2. The all the ingredients was weighed and passed through Sieve no. 24.
3. Then all ingredients were mixed uniformly to prepare homogenous mixture of a powder form of dye.
4. The homogenous mixture was weighed and packed in a plastic bag.

EVALUATION OF THE HERBAL HAIR DYE

A. Organoleptic evaluation of hair dye

1. Color of formulation
2. Odor of Formulation
3. Appearance
4. Texture

B. Physio - chemical evaluation

1. The physical and chemical features of the herbal hair dye were evaluated to determine the pH, its moisture content for the purpose of stability, compatibility and the amount of inorganic matter present in it.

C. Phytochemical evaluation

a) Molisch's test

Take 1 gm of sample in dry test tube

Take 2 ml of distilled water in a sample

Add 2 to 3 drops of Molisch's reagent to solution

Observe color change at junction of two layers

b) Volatile oil test

Sample + alcoholic solution of Sudan III

Observe the color

c) Mayer's test (For alkaloid)

Sample + Mayer's reagent

Observe the color

D. Rheological evaluation

Bulk Density: Weigh accurately 5gm of powdered dye and transfer in 100ml of measuring cylinder Carefully level the powder blend without compacting, and read the unsettled apparent value.

Bulk density= Bulk mass/Bulk volume

Tapped Density: Weigh accurately 5gm of powder dye and transfer in 100ml measuring cylinder.

- Then precisely tap the chamber containing the example by raising the chamber and permitting it to drop under its own weight utilizing mechanical tapped thickness analyzer at ostensible pace of 300 drops each moment.
- Tapped Density = Mass/Tapped volume ¬

- % Carr's index

  (Tapped density- Bulk density)/ tapped density*100
- Housner's Ratio -

  Tapped density/Bulk density

1. Organoleptic Evaluation

Organoleptic aspects for a variety of sensory attributes, such as color, odor etc., were meticulously recorded. As shown in table the organoleptic and morphological characteristics of the raw medications and powders, such as color, texture, and appearance, were independently examined.

S. No.	Parameter	Formulation A	Formulation B
1	Color	Brownish green	Brownish green
2	Odor	Characteristic	Characteristic
3	Texture	Fine	Fine
4	Appearance	Powder	powder

2. Phytochemical evaluation

Phytochemical testing was done on the formulations of herbal hair dye in order to determine which phytoconstituents were present including sugars, lipids, carbohydrates, and alkaloids. Several phytoconstituents were detected in the aqueous extract of the resulting herbal hair dye using standard operating procedures and established methodologies. Table highlights the phytochemical screening outcomes.

Molisch's test

Materials required:-

- Herbal hair dye formulations as a sample
- Distilled water,
- Alpha- naphthol,
- Absolute ethanol,
- Sulphuric acid

S. No	Parameter	Formulation
1.	Molisch's test	Carbohydrates were present
2.	Mayer's test	Alkaloid was present
3.	Volatile oil test	Volatile oil was present

Rheological evaluation of herbal hair dye

For the internal formulation, physical parameters including angle of repose, bulk or untapped density tapped density, tapped density, Housner's Ratio and Carr's index were measured and calculated. The formula for computing bulk density (D) is D=M/V, where M is the mass of the particles and V is the total volume, they fill. This is measured with a graduated cylinder .100 g of the weighted formulation were added to the cylinder using a funnel. Following the recording of the starting volume, the sample was extensively tapped. The bulk density value was obtained by comparing the starting volume with the volume identity after tapping. This value was then utilized to calculate the tapped density. The angle of repose measures the powder's flow properties since it affects how cohesive the different particles are with one another. The fixed funnel cone method is utilized to determine the height (H) above the paper that is put on a level surface. The pack was slowly poured into the funnel until the peak formed. In this case, an is the angle of repose, and tan is equal to either H/R or are tan H/R. R stand for the radius of the conical heap. Housner's ratio is connected to the powder flow and is influenced by the antiparticle friction.

Housner's ratio is calculated as D/D where D is the tapped density and D is the bulk density. Carr's index is a measure of a powder's compressibility. Table in presents results collected for the rheological assessment of herbal hair coloring.

S. No	Parameters	Formulation
1	Bulk density	0.5g/cm
2	Tapped density	1.25g/cm
3	Angle of repose	41.250
4	%Carr's index	60%
5	Housner's ratio	2.5

Stability testing of herbal hair dye

The created formulation was subjected to a month's worth of storage at various temperatures in order to verify its stability. The formulations of packed glass vials were examined for physical characteristics like smoothness, texture, odor, PH, and color as shown in table while being stored at room temperature 35C.

S. No	Parameters	Room temperature	35 c
1	Color	no change	no change
2	Odor	no change	no change
3	PH	6.5	6.7
4	texture	fine	fine
5	smoothness	smooth	smooth

Fig. 1: Blonde human hair.

Fig. 2: Color of formulation B in blonde human hair.

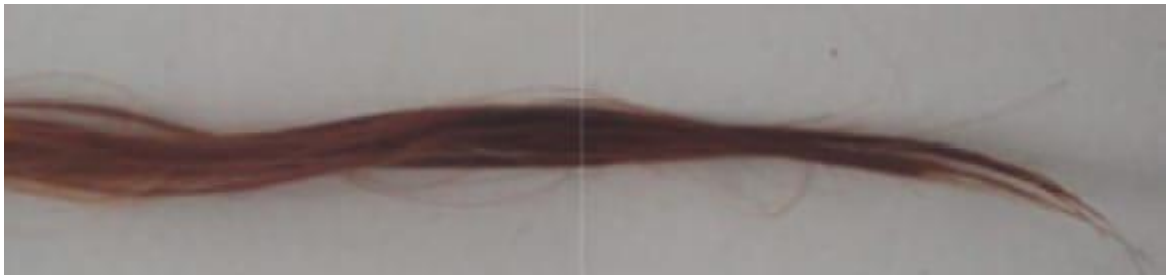

Fig. 3: Color of formulation A in blonde human hair.

Procedure

Weigh 5 g of potassium iodide (KL) and 1.358 g of mercuric chloride using a precise balance. Dissolve the weighted potassium iodide in 60 ml of distilled water in a clean container. Stir the solution in order to completely dissolve the KL. Add the mercuric chloride to the KL solution while stirring continuously. Continue stirring until the mercuric chloride is completely dissolved. Once the solution is homogeneous, take a small amount of finely powdered sample

and place it in a test tube. Add a few drops of Mayer's reagent to the test tube using a dropper or pipette. Observe the color change in the test tube. The presence of alkaloids in the sample will result in the formation of a creamy precipitate or turbidity within a few minutes. Compare the test tube with a control tube containing distilled water and Mayer's reagent. The control tube should remain clear, indicating the henna is reddish -orange while the color of indigo is blue -black. The procedure herbal hair dye is made up entirely of beneficial natural components. Due to the ideal herbal combination in this composition .it is sample to store and stable at temperature 20 and 35c the formulation 2 shows better hair color than formulation 3 which also promotes hair growth, strength and decreases hair damage. When henna (25%) is mixed hibiscus (7%) clove (2%) along with amla(5%) coffee (2%) tea (2%) ,kalonji (2%), guava (5%) the observed hair color become darker after washing . it is devoid of the harmful effects of ammonia -based chemical color because it is a formulation made from natural herbs. However, consistent use of it results in thick, silky, and beautifully colored hair.

RESULTS

Henna Mixture

Likely to give a reddish-orange hue, with a shiny and conditioning effect. Some users may find it provides more vibrant colour on lighter hair and a more subdued tint on darker hair.

Indigo Mixture

If used alone, indigo gives a blue-black colour. If used with henna, it will likely produce darker brown to black shades.

Formulation A and B

The outcome will depend on what these formulations contain. For example, if Formulation A has a blend of Amla or Brahmi, it could make the hair stronger or provide a slightly darker tone. Formulation B could have added oils or extracts that enhance the colour's vibrancy or conditioning properties.

Post-Wash Colour

After washing, you would likely observe a more natural, rich colour with herbal mixtures. The colour may take a day or two to fully develop and stabilize, especially with henna and indigo. This is typical because the dye gradually sets in over time.

Hair Condition After Use

Expect the hair to feel soft, conditioned, and possibly thicker, as many herbal ingredients like henna have natural moisturizing and strengthening properties.

DISCUSSION

Four different mixtures were prepared by taking 10 g of powder (henna, formulation A and B) and making a slurry of it. Keep that slurry for 24 hr. now take a blonde hair (figure 1) and apply paste on it. wash it after one hour. The observed colour of the hair.The formulation and evaluation of herbal hair dyes is a crucial process that combines both the artistry of hair coloring with the science of natural ingredients. Herbal hair dyes are increasingly popular due to their natural origin, lower toxicity, and benefits for hair health. In this discussion, we will explore the various aspects of formulating and evaluating these dyes, including their ingredients, application methods, and the outcomes of using herbal mixtures on hair.

CONCLUSION

The formulation and evaluation of herbal hair dyes present a balanced combination of aesthetics, safety, and hair care. While the application process may take longer and the color development might not be as immediate as with chemical dyes, herbal hair dyes offer a natural, non-toxic alternative that conditions and strengthens the hair. The longevity of the color and the additional benefits of herbal ingredients, such as enhanced shine and nourishment, make herbal hair dyes a compelling choice for many individuals seeking a more natural hair care solution. However, the variations in results based on hair type, formulation ratios, and individual sensitivities highlight the importance of conducting thorough evaluations to optimize the formulation for desired outcomes.

In this study the herbal hair dye pack was formulated evaluated and application on the blonde hair was carried out. The color obtained from the pack is close to natural hair black color. Also the flow property of formulation B is better than the first formulation A so it is easy to make a slurry and apply on hair . however further studies on the application of formulated hair dye packs on different human hair of different shades are required to determine its full range of potential advantages.

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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).