Formulation And Evalution of Herbal Disinfectant Cream: Containing Colocasia

Ms.Thombre Samiksha[1], Mr.Shinde Ananda[2], Mr.Salunke Shivam[3], Miss.Pundkar Ashwini[4], Mr.Kamble Kaushik[5], Dr. Payghan Santosh[6]

[1,2,3,4,5,6]*Rajesh bhaiyya tope collage of B-Pharmacy Nipani, bhalgaon, Chh. Sambhajinagar*

Abstract- The present study investigates the formulations of an herbal disinfectant cream utilizing leaf extract from Colocasia esculenta, a plant noted for its antimicrobial and wound-healing properties. The study details how the leaf extracts were integrated into a cream base that was optimized for spread ability, stability, and used an acceptability. A through phytochemical screening revealed the presence of beneficial bioactive compounds such as flavonoids, tannins, saponins, and polyphenols, which enhance antimicrobial effectiveness. Physicochemical properties of the formulations, such as pH, viscosity homogeneity, and self-stability, were rigorously evaluated under different storage conditions. The antimicrobial activity of the cream was tested against a range of common pathogenic microorganisms, with the results showing that the Colocasia-based cream had significant inhibitory effects when compared to control formulations.

The findings suggest that Colocasia esculenta extract is a potent natural disinfectant, providing a safer, plant-based alternative to synthetic antimicrobial creams. This study emphasizes the therapeutic potential of the phytochemicals derived from Colocasia and advocates for further research into herbal formulations aimed at topical disinfectants

Keywords: Taro, Phytochemical Screening, Antioxidant Activity, Antifungal Activity, Wound Healing, Antioxidant, Flavonoids, Tannins

I. INTRODUCTION

Herbal Disinfectant

An herbal disinfectant is a disinfecting agent derived from plant sources such as essential oils, extracts, or phytochemicals that possess antimicrobial, antifungal, antiviral, or antiseptic properties. These agents inhibit or kill pathogenic microorganisms on surfaces, skin, wounds, or in the environment without the harmful side effect associated with synthetic chemicals.

Example: Neem, turmeric, tulsi, tea tree oil, clove oil, thyme, citronella, etc.

These creams offer a natural alternative to chemical-based formulation for wound healing, minor

Colocasia widely cultivated plant that also possesses valuable pharmacological properties.

The content of Colocasia esculenta leaves saponins, flavonoids, tannins, alkaloids, terpenoid, and steroids hormones participate in healing process[1].

Disinfectants play a crucial role in controlling microbial infections on skin surfaces. However prolonged use of synthetic disinfectants may lead to skin irritation, toxicity, environmental hazards, and microbial resistance. Herbal disinfectants derived from plant sources offers a safe and more sustainable alternative due to their biocompatibility and minimal side effects.

Colocasia esculenta family: Araceae, commonly known as taro, arbi, or eddoe, is widely used in traditional medicine. Its leaves are rich in bioactive compounds such as flavonoids, tannins, saponins, and polyphenols, which exhibit antimicrobial, antioxidant and wound-healing activities. These properties make C. esculenta a promising candidate for herbal disinfectants cream incorporating Colocasia esculenta leaf extract and assessing its physicochemical and antimicrobial properties.

The goal of this project is to prepare an anti-disinfectant herbal cream using the active compounds of Colocasia esculent and to evaluate its effectiveness in treating common skin problems rashes, and minor cuts. The plants medicinal properties lie primarily in its phytochemical which include compounds flavonoids, tannins saponins, and alkaloids. These bioactive compounds has been shown to exhibit

antimicrobial, anti-inflammatory, and antioxidant activities, flavonoids, for instance, help to harmful free radicals, while tannins act as astringents helping to tighten tissues and protect microbial invasion[2,3].

Classification of herbal dis

Herbal disinfectant can be classified based on source, active constituents, or application

1. Based on plant part used:-
- Leaf-based disinfectant Neem, tulsi, aloevera.
- Root-based disinfectants ginger, turmeric.
- Bark-based disinfectant cinnamon, arjun bark.
- Flower- based disinfectant lavender, chamomile, clove.

2. Based on antimicrobial action:-
- Antibacterial herbal disinfectants Neem, garlic, turmeric.
- Antifungal herbal disinfectant tea tree oil, clove oil.
- Antiviral herbal disinfectants tulsi, eucalyptus, cinnamon.

3. Based on formulation type:-
- Herbal surface disinfectant Neem extract sprays, eucalyptus-based floor cleaners.
- Herbal hand disinfectants tulsi-aloe vera gels, tea tree-based sanitizers.
- Herbal air disinfectant camphor, incense with antimicrobials oils, fumigants.
- Herbal wounds/skin disinfectants turmeric paste, aloevera gel[4,5].

4. Based on method of preparation:-
- Decoctions/kashavas Neem leaf decoction.
- Infusion tulsi or clove infusion.
- Extract-based disinfectants alcoholic or hydro-alcoholic herbal extract.
- Oil based preparations essential oils, oleoresins.
- Colocasia esculent commonly known as taro or Arbi.
- In ayurvedic and folk medicine, Colocasia leaves and tubers are used to treat various
- Ailments including skin infection, wound healing, inflammation, and digestive issue.
- Its leaves are rich in polyphenols, flavonoids, tannins, vitamins, giving them antioxidant, antimicrobial, and anti-inflammatory properties.

DRUG PROFILE[6,-10]:

Plant to be used: Colocasia

Synonyms: Taro, arbi, eddoe, dasheen, elephant

Family: Araceae

Fig. No. : 1 Colocasia

Tab No. : 1 Taxonomy

Botanical Name	Colocasia esculenta
Kingdom	Plantae
Order	Alismatales
Subfamily	Aroideae
Tribe	Colocasiodeae
Genus	Colocasia
Species	C. esculenta

Common name: Taro, Kalo, Eddy root, wild taro, talas

Chemical constituent: It mainly contains saponins, flavonoids, tannins, alkaloids, terpenoids and steroids hormones

Uses/ Application:

1. Natural and gental
2. Antimicrobial action
3. skin-friendly
4. Reduced toxicity
5. Environmental friendly
6. Anti-inflammatory
8. Antioxidant
9. wound healing
10. Hand and minor wound care

Phytochemicals:

Colocasia esculenta (taro)leaves are rich in bioactive compound, featuring a high concentration of flavonoids (caffeic, gallic), saponins, steroids, and glycoside. These are phytochemical, along with nutrients like vitamins C and A, minerals, and dietary fiber, provide strong antioxidant, antibacterial, and anti-diabetic properties.

Phytochemical components in Colocasia leaves:

- Flavonoids: The primary compounds, including luteolin, apigenin, chrysoeriol, orientin, vitexin, and their glycosides.

- Alkaloids & Terpenoids: Present as significant bioactive compounds.
- Saponins & Steroids: Including beta sitosterol, stigmasterol, and taraxerol.
- Other Constituents: Tannins, reducing sugar, and mucilage[11-15].

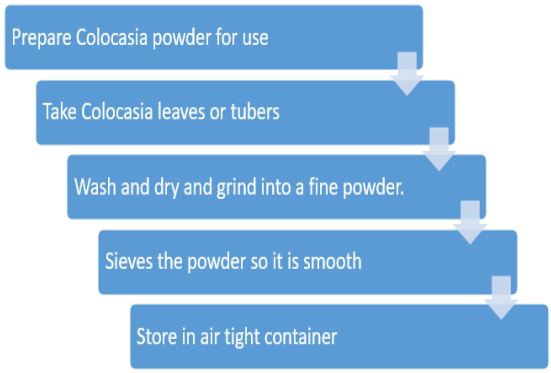
Method and Material

Sr. No.	Particular	Quantity
1	Steric Acid	6g
2	Cetyl Alcohol	2g
3	Liquid Paraffin	8g
4	Glycerin	5g
5	Methyl Paraben	0.2g
6	Trayethenolamide	1.5ml
7	Preservative (Methyl Paraben)	0.2g
8	Distilled Water	Q.S. 100ml
9	Colocasia Powder	4g
10	Starch	10g

Glassware & Instrument[16-21]

- Beaker
- Weighing Balance
- Stirrer
- Spatula
- Butter Paper
- Measuring Cylinder
- Heating Plate
- Container
- Mortal and pestle
- Refrigerator
- Label paper

Formulation procedure:



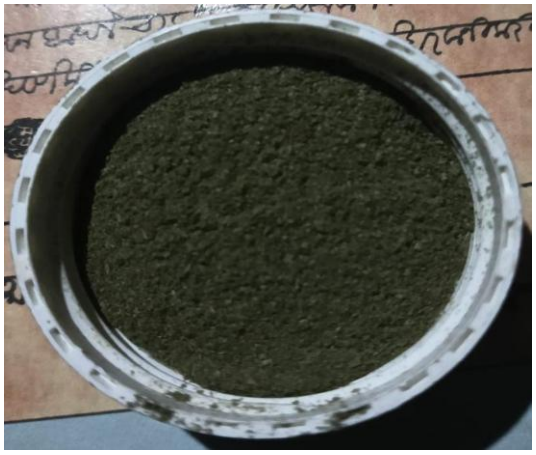


Fig. no. : 2 Colocasia powder

Step 1: Preparation of aqueous phase Accurately weigh glycerin and dissolve methyl paraben in small quantity of warm purified water (~70) Disperse a starch slowly in purified water with continuous stirring to avoid lump formulation and heat gently until a smooth slurry is obtained Add the Colocasia esculenta leaf extract to this mixture and stir well.

Step 2: Preparation of oil phase Weigh cetyl alcohol and liquid paraffin accurately Melt them together in a porcelain dish on a water bath at about 70.

Fig.no.:3 Prepared aqueous phase and oil phase

Step 3: Emulsification slowly add the oil phase to the aqueous phase with continuous stirring. Maintain the temperature around 70 during mixing to form a uniform emulsion.

Step 4: addition of emulsifying agent Add triethanolamine dropwise with continuous stirring to stabilized the emulsion and adjust consistency.

Step 5: Cooling and Homogenization Continue stirring while allowing the cream to cool gradually to room temperature proper stirring ensures uniform distribution of starch and herbal extract.

Step 6: Final Adjustment Check the pH (should be 5.5 -7.0) If required adjust pH using small amounts of triethylonamine.

Step 7: filling and storage transfer the prepared cream into a clean, dry, and sterilized container Label and store in a cool place

Evaluation test:
Physicochemical parameter and evaluation:

1. pH determination: 5.7-6.0
2. Viscosity: indicates thickness and ease of application
3. Spreadability: Good spreadability for topical use
4. Washability: Easily washable without residue
5. Absorbality: easily absorbed
6. Physical appearance: Creamy structure[22-26]

CONCLUSION

The formulated herbal disinfectant cream containing Colocasia powder (O/W cream based with steric acid, cetyl alcohol, liquid paraffin, glycerin, triethanolamine and methyl paraben) produce stable, smooth cream with acceptable physicochemical properties (pH ~ 5.5-6.5. good spread ability and viscosity suitable for topical use). The Crame exhibited measurable antimicrobial activity against common skin pathogens in vitro, while preservatives efficacy testing showed acceptable microbial control during the test period. Patch testing indicated good skin tolerability in healthy volunteers. Overall, the product demonstrated potential as a mild, plant-based topical disinfectant with wound-supporting and smoothing properties; however, further standardization of the Colocasia material, extended stability studies, and clinical evaluations are recommended before commercialized.

REFERENCE

[1] Carnot, A.C., Emmanuel, E.L., Ledoux, N.D.G., Patrick, A.N., Arthur, M.J., Annie, N.N., Zachée, A., Fabrice, M.T. and Gautier, D.L., 2017. Study of Antagonistic Beneficial Microorganisms to Phytophtora colocasiae, Causal Agent of Taro Mildew (Colocasia esculenta (L.) Schott). *Plant*, *5*, pp.51-60.

[2] Ambang, Z., Chewachong, G., Ngatsi, P.Z., Nganti, D.M., Tueguem, W.K., Heu, A., Dooh, J.P.N. and Sale, C.E., 2021. Efficacy of methanolic and aqueous extracts of Thevetia peruviana (pers.) K. Schum on growth of Phytophthora colocasiae Racib, causal agent of taro late blight in Cameroon. *Journal of Applied Life Sciences International*, *24*(4), pp.44-54.

[3] Gharib, D.S.H. and Salman, R.F., 2023. Feasibility of the crude extracts of Amorphophallus paeoniifolius and Colocasia esculenta as intracanal medicaments in endodontic therapy in comparison to the 940 nm diode laser: an in vitro antimicrobial study. *Journal of Dental Sciences*, *18*(1), pp.145-156.

[4] Danahap, L.S., Christopher, I. and Okechalu, O.B., 2023. Incidence of Bacteria Associated with Post Harvest Rot of Colocasia esculenta LIN (Cocoyam) Tubers Sold in Different Markets in Bukuru, Jos South Local Government Area, Nigeria. *Nigerian Journal of Microbiology*.

[5] Putri, O.A., Kresnoadi, U. and Dahlan, A., 2020. The effectiveness of Taro (Colocasia esculenta L. Schott) leaf extract as a denture cleanser against Candida albigens plate. EurAsian Journal 14(2), pp.3805-3808

[6] Paudilah, P., Raviah, N., Lestari, D., Lestari, S.and Parliana, P., 2023. Comparison of the Effectiveness of Taro Leaf Stalk Extract.

[7] Parliana, P., 2023. Comparison of the Effectiveness of Taro Leaf Stalk Extract (Colocasia Esculenta) with Gentamicin Sulfate Cream in the Wound Healing Process in White Rats. Enrichment: Journal of Multidisciplinary Research and Development, 1(1), pp.1-13.

[8] Mahapatra, S.S. and Vishwanathan, A.S., 2025. Improving the Efficiency and Turnover of a Domestic Wastewater Treatment Plant Using Coagulation-Flocculation. Water and Environment Journal.

[9] Harlis, W.O. and Akbar, M.D., 2022, February. The Effectiveness of Taro Leaf Stalk (Colocasia esculenta L.) Ointment Extract on Burn Wound Healing in mice (Mus musculus L.). In Proceeding International Conference on Religion, Science and Education (Vol. 1, pp. 553-560).

[10] Budiarti, L.Y., Derlin, E.P., Amalia, M.K., Ihsanti, S.H. and Fahmi, Y., 2025, April. Ability Test of Taro (Colocasia esculenta L.) Leaves Extract to Reduce Coliform Bacteria in River Water. In *Proceeding International Seminar of Science and Technology* (Vol. 4, pp. 172-181).

[11] Ginting, B., Isnaini, N., Khairan, K., Saidi, N., Murniana, M., Bahi, M., Yahya, M., Gunana, T.Z.T., Saleha, S. and Riski, C.D., 2026. Antibacterial and anti-tyrosinase activity of eucalyptus leaf [Melaleuca leucadendra (L.) L.] acne spot emulgel: Formulation and evaluation. *Journal of Pharmacy & Pharmacognosy Research*, *14*(1), p.2299.

[12] Ogujawa, C.N., Ovowa, O.F., Uwanta, L.I., Oghonim, P., Okoli, F.A., Anazodo, C.A., Okoye, C.V., Okonkwo, N.N., Ebo, P.U. and Umeoduagu, N.D., 2026. Biochemical, Histopathological, and Microbiological Assessment of Herbal Bitters-Induced Hepatotoxicity and Gut Health Alterations in Albino Rats. *Int. J. Adv. Res. Biol. Sci*, *13*(1), pp.45-66.

[13] Ahmed, M.S., Setu, M.A.I., Goswami, A., Sultana, M.S., Dhar, P.K., Haque, M.R. and Dutta, S.K., 2026. Investigating the antioxidant, antibacterial, and antifungal properties of typha domingensis leaves assisted synthesized zinc oxide nanoparticles. *PloS one*, *21*(1), p.e0337942.

[14] Amara, F.B., Hmida, B.B.H., ElHadef, K., Smaoui, S. and Jemli, S., 2026. Plant Roots as Unconventional Food Source. In *Health, Nutrition and Sustainability* (pp. 411-427). Academic Press.

[15] Ramos, C.E.S., Muñoz, M.C.G. and Granada, D.R.P., 2026. Colombian gastronomic heritage: Cuisine of freedom. In *The Science and Culture of Latin American Foods* (pp. 9-32). Academic Press.

[16] Kunwar, T., Kathuria, D., Paul, M. and Singh, N., 2026. Metabolomic Insights into Tubers and Tuber-Based Foods: Post-Harvest Storage, and Thermal Processing: A Review. *International Journal of Food Science and Technology*, p.vvag008.

[17] Nurwahdini, E., Mahdi, N. and Agustina, A., 2025. FORMULATION AND EFFECTIVENESS TEST OF ANTISEPTIC LIQUID HAND WASHING SOAP PREPARATION FROM TARO LEAF ETHANOL EXTRACT (Colocasia esculenta). *Journal of Pharmacology Experiment and Pharmaceutical Technology*, *1*(1), pp.17-22.

[18] Samadder M, Rahman S, Huda KT, Hossain MA, Patwary MA, Yasin M. Antioxidant and antimicrobial prospects of Colocasia esculenta stolon: a phytochemical perspective. Discover Food. 2025 Feb 27;5(1):52.

[19] Ardiani, R., Shufyani, F., Siregar, S.M. and Silalahi, A.A., 2025. Formulasi salep sari batang daun talas (Colocasia esculenta L.) schoot pada penyembuhan luka sayat pada tikus putih jantan (Rattus norvegicus). *Journal of Pharmaceutical and Sciences*, pp.187-195.

[20] Ugosor, T.P., David, A.K.W. and Timothy, O.T., 2025. COMPARATIVE PHYTOCHEMICAL AND IN VITRO ANTIMICROBIAL STUDIES OF AQUEOUS LEAVES EXTRACTS OF COLOCASIA ESCULENTA, AZADIRACHTA INDICA AND MORINGA OLEIFERA. *World*, *1*(5).

[21] de Almeida, B.S., de Carvalho Gomes, Q.C., de Menezes, R.C.F., de Oliveira, T.P., Maciel, L.F., de Matos, M.F.R. and Matos, L.C.P., 2025. Innovative Products of Mayonnaise-Type and Dessert Creams Developed with the Kefir-Based Beverage of Colocasia Esculenta. *Journal of Culinary Science & Technology*, pp.1-19.

[22] Zahra, I.T.A. and Sukendra, D.M., 2025. Formulation and Antibacterial Activity Testing of Nanoemulsion Cream from Coriander Seed Extract (Coriandrum sativum L.) in Inhibiting Protein Synthesis of Staphylococcus aureus Bacteria. *Journal of Science and Technology Research for Pharmacy*, *5*(1), pp.14-26.

[23] Ginting, B., Isnaini, N., Khairan, K., Saidi, N., Murniana, M., Bahi, M., Yahya, M., Gunana, T.Z.T., Saleha, S. and Riski, C.D., 2026. Antibacterial and anti-tyrosinase activity of eucalyptus leaf [Melaleuca leucadendra (L.) L.] acne spot emulgel: Formulation and evaluation. *Journal of Pharmacy & Pharmacognosy Research*, *14*(1), p.2299.

[24] Aho, M., Irshad, A., Ackerman, S.J., Lewis, M., Leddy, R., Pope, T.L., Campbell, A.S., Cluver, A., Wolf, B.J. and Cunningham, J.E., 2013. Correlation of sonographic features of invasive ductal mammary carcinoma with age, tumor grade, and hormone-receptor status. *Journal of Clinical Ultrasound*, *41*(1), pp.10-17.

[25] Poling, J., Len Kelly, M.D., Chan, C., David Fisman, M.D. and Marina Ulanova, M.D., 2014.

Hospital admission for community-acquired pneumonia in a First Nations population. *Canadian Journal of Rural Medicine*, *19*(4), p.135.

[26] Al-Habian, A., Harikumar, P.E., Stocker, C.J., Langlands, K. and Selway, J.L., 2014. Histochemical and immunohistochemical evaluation of mouse skin histology: comparison of fixation with neutral buffered formalin and alcoholic formalin. *Journal of Histotechnology*, *37*(4), pp.115-124.