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FORMULATION AND EVALUATION OF ANTIMICROBIAL CREAM FROM *PHYLLANTHUS RETICULATUS*

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ABSTRACT

Medicinal plants have therapeutic properties due to the presence of the different complex chemical substances of different composition, which are have been discovered as secondary plant metabolites in one or more parts of these *Phyllanthus reticulatus* is a type of leaves in the Euphorbiaceae family(1). Phytoconstituents in the seed extracts may be organized for the antimicrobial activity of the plant. The reason for the study was to prepare and judge the antimicrobial herbal cream from extracts of the seeds of *Phyllanthus reticulatus*(2). The prepared ointments containing oleaginous-based displayed the best formulation co-related to the emulsion water in oil type, the ointment and cream bases in various types of concentration 1%, 5%, and 10%. The prepared ointment and cream of MI L. Were chanced to measured Uniformity of Weight, measurement of pH, viscosity, Spreadability, Acute skin irritation study, stability study, and antimicrobial activity. As per our analysis or inquiry, MI has high potential as compared to an antimicrobial agent when prepared as ointment and creams for topical use. Hence, our study shows that prepared formulations of the MI are a safe and active agent, with dynamic antimicrobial activity.

Keywords*:* - *Phyllanthus reticulatus*, Euphorbiaceae, Formulated ointments, Antimicrobial activity.

INTRODUCTION

The plants named as 'Rasayana' have been provided with properties like strengthening the phycho-neuroimmune axis. Abnormalities of the immune system are responsible for various diseases like cancer, allergy, arthritis, ulcerative colitis, asthma, parasitic diseases, and infectious diseases. Plants are the better and traditional sources for the curability of various diseases in the form of medicines. The first thing done in the field of immunomodulation was the search of the immunomodulatory agent for the treatment of residual cancer (3). *Phyllanthus reticulatus* Poir (*P. reticulatus*) (Family: Euphorbiaceae) is a large, often scandent, shrub which grows throughout tropical areas of India, Bangladesh, China, and the Malay Islands. The leaves of the plant are diuretic and also used for diarrhea in the baby. The leaf juice is a remedy for spongy and bleeding gums. The biological work carried out so far on this plant showed anti-diabetic, anti-plasmodial, hypocholesterolemic and cytotoxic, hepatoprotective, antinociceptive and antihyperglycemic, analgesic and anti-inflammatory, and antibacterial activities(4). Three compounds (lupeol, lupeol acetate, and stigmasterol) were isolated and established by the phytochemical study conducted on the leaves of *P. reticulatus*. Other isolated compounds were tannic acid, friedelin, epifriedelinol, betulin, taraxerone, β-sitosterol, glochidonol, octacosanol, taraxeryl acetate and 21-alpha-hydroxyfriedelan-3-one, betulinic acid. Eight compounds (β-sitosterol-3-O-β-glucoside, stigmasterol-3-O-β-glucoside, methyl gallate, ellagic acid, corilagin, methyl brevifolin carboxylate, kaempferol, astragalin), including two flavonoid glycoside rutin (quercetin-3-rutinoside) and quercetin-3-O-β-D-glucopyranoside (isoquercitrin), were isolated from the butanol soluble fraction of the methanolic extract of the leaves of *P. reticulatus* by conventional methods. Ellagic acid was found as the chemical constituent for the inhibition of rheumatoid arthritis. (5)

Antimicrobial activity:

The methanolic extract of stem bark of *P. reticulatus* was found to have antimicrobial activity. The antimicrobial activity was possessed by the disc diffusion method. The samples were dissolved separately in chloroform and applied to sterile filter paper discs at a concentration of 400 microgram/disc. Kanamycin disc (30 micrograms/disc) was used as standard. The zone of inhibition produced by the pet ether, carbon tetrachloride and chloroform soluble fractions of methanolic extract ranged from 14-19mm, 14-20mm and 10-18mm, respectively(3).

MATERIALS AND METHODS

Plant material

Leaves and fruits of *P. reticulatus* were collected from the campus of Shivaji University, in the month of July-August.

Chemicals and instruments:

Compound microscope, glass slides, coverslips, watch glass and other common glassware were the basic apparatus and instruments used for the study. Microphotographs were taken using a Leica DMLS microscope attached with a Leitz MPS 32 camera. Solvents viz. petroleum ether, benzene, chloroform, acetone, ethanol (95%), n-butanol and reagents viz. phloroglucinol, glycerine, HCI, chloral hydrate, and sodium hydroxide were obtained from Ranbaxy Fine Chemicals Ltd., Mumbai, India. (6)

Extract preparation:

The plant material was coarsely powdered using the dry grinder and extracted with pet ether (60-80 °C) in the Soxhlet apparatus at a temperature not exceeding 60 °C. The defatted plant material was then removed with hydroalcoholic. The extracts were concentrated under reduced pressure in a rotary evaporator to yield a crude semi-solid mass. The semisolid blackish extract was obtained from dried ripe fruits and the brownish-black extract was obtained from dried leaves of the plant. (6)

Formulations:

The cream was ready with Phase A (40% Emulsifying wax, 1% Cetyl alcohol, 1% Bee's wax, 1.3% Lanolin at75C), phase B(100mL Distilled Water and 0.15%preservative (Methyl Parahydroxy Benzoate) and Phase C(6% Glycerine and 5% essential oil of *Trachyspermum ammi*). The ingredients of phase A were mixed and heated at 75^{o}C. The ingredients of phase B were mixed separately. The mixture of phase B was mixed with phase and stirred well at room temperature until the complete mixing. The ingredients of phase C were mixed with a mixture of phases A and B and stirred well till the complete mixing. (6)

Table No. 1: Formulation Table

Ingredients	Quantity
Stearic acid	15g
White wax	2g
Yellow Vaseline	8g
Triethanolamine	1g
Propylene glycol	8g

RESULT AND DISCUSSION

Table No. 2: Antimicrobial activity of essential oil of *T. ammi*

Test Organisms	Inhibition zones (in mm)
SDV	
Lactobacillus acidophilus	0.00 ± 0.00
Escherichia coli	14.3± 0.031
Micrococcus luteus	05.2± 0.031
Bacteria	
Staphylococcus aureus	09.2± 0.043
Aspergillus oryzae	14.4±0.037
Penicillium digitatum	06.4± 0.033
Fungus Mucor	09.3±0.00

From the above evaluation test, it was found that *Phyllanthus reticulatus* shows anti-microbial activity against the *Lactobacillus acidophilus, Escherichia coli, Micrococcus luteus, Staphylococcus aureus, Aspergillus oryzae, Penicillium digitatum, Fungus Mucor*.

CONCLUSION

Necessity is the mother of invention. This mistreatment fully applies to rural or ancient societies, which have to discover solutions to almost all their needs and problems from the natural resources around them. In recent years, ethnomedicinal studies received much attention as this brings to light the many little knowns and unknown medicinal slice, especially of plant origin. In the present article, we have reviewed the permanent literature to congregate the botanical, ethnobotanical, phytochemical and pharmacological information on *Phyllanthus*

reticulatus. Examine literature discuss that the plant is having unfavorable pharmacological activities. The analysis of literature also pinpoints the fact that although the number of diseases for which *Phyllanthus reticulatus* finds used as medicine is fairly large yet its therapeutic effectiveness has been evaluating only in few cases. Because of the wide range of medicinal uses of the plant, more clinical and pharmacological studies must be managed to proposed unexploited potential.

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