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AN ELABORATE REVIEW OF PHYTOPOTENT ACTIVITY OF *ALLIUM SATIVUM* (GARLIC) CREAM.

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ABSTRACT

The main purpose of our garlic cream was to develop secondry treatment of skin infection, which enhances skin properties. That formulation agrees to a medicinal cream that has mainly two antifungal active properties. It helps to fungal treat fungal skin infection as well as other skin problems for any skin infection it is best topical approach and Best options. Because of the many advantages and conventional routes of drug administration, the development of topical drug delivery systems with systemic effects appears to be beneficial for a variety of medications. Garlic and clove oil was the active pharmaceutical ingredients (API) used to treat skin infections. It involves two types of primary and secondary emulsifiers, co-solvents, buffering agent, waxy material, two preservatives, a buffering agent, a humectants, and water in the cream base. When the active components are combined, they provide a potent antifungal effect. The many experiments were done to evaluate the physicochemical characteristics of formulated cream, such as visual inspection, pH measurement, expandability, skin irritant test, etc. The cream was further analyzed with the use of nutritional agar for antifungal activity. The medicated cream was good in consistency and color; however the smell of the garlic was quite unpleasant, so the odor of the garlic was masked with peppermint oil, which also acting as an additional antifungal agent, in improved version.

Keywords : *Allium sativum (*Garlic*), Allii iii, Ajoene iv, Allicin,* Various activities.

INTRODUCTION

Traditional medicines occupy a valuable place amongst rural groups of developing countries for the provision of health care inside the absence of an efficient public health care scheme.The use of traditional treatments is common in sub-Saharan Africa, and visits to traditional healers remain a prime live of care for many people because of preference, affordability, limitation of practitioners and modern hospitals. Moreover traditional medicines may be the supply of remedy for lots of health complications.Garlic, *Allium sativum* is a member of the Alliaceae family, has been widely recognized as a precious species and a popular medicine for various physiological disorders and various diseases. The word garlic was originated from the Celtic word meaning pungent. Garlic is cultivated throughout the world and the origin of garlic in central Asia and then circulate to the Near East, China and the Mediterranean region before moving west to Central and Southern Europe, Northern Africa (Egypt) and Mexico.5-7 Garlic has played an essential role for over 7,000-years in central[1].
The last few reports have reported as an increase in fungal infection. Fungal infections are evolving diseases in sanatorium institutions. Increase in immunosuppressive diseases fungal infections is currently at a crucial stage.Fungal infection caused by *Candida* has become more prevalent than *Escherichia coli* and *Pseudomonas sp*. *Aspergillus streptococcus*[2]. These include immobility, mucositis, use of antibiotics ,radiation therapy or certain immunosuppressive agent's medicinal plant material to cure any disease or to give a satisfactory treatment against that disease. For the treatment of infectious and non-infectious skin disorder the plants are used. The antimicrobial effect of some plants is attributed to the number of phytoconstituents like flavonoid,

tannins, triterpenes etc.The aim of study is a based on the medicinal property of a plant i.e. Garlic (*Allium sativum*) and clove oil *(Eugenia caryophyllus)*Garlic oil shows a wide range antimicrobial activity. Alliin is the main chemical constituent in garlic oil which shows antimicrobial activity. This oil consists of sulfur containing six compounds such as i. allicin ii. Allii iii, Ajoene iv. Diallyl disulfide, v.dithiin.the vedic era humans uses medicinal plantsma or to cure any disease or to give a satisfactory treatment against that disease. On earth there is no any plant which is without any therapeutic or medicinal properties. It shows the importance of the plant and every parts of the plant. The current study of the this review based on medicinal properties of *allium sativum (*garlic).

MATERIAL AND METHOD MATERIAL

Propylene glycol, bees wax, stearyl alcohol, cetyl alcohol was purchased from Research-lab of Industries Garlic.

VERNACULAR CLASSIFICATION

kingdom	plantae
order	asparagales
family	amaryllidaceae
subfamily	allioideae
genus	*allium*
species	*allium sativum*

FORMULATION TABLE

ingredients	activity
white bees wax	thickening agent
steric acid	emulsifying agent
stearyl alcohol	emollient
cetyl alcohol	bonding agent
liquid paraffin	moisturizer

PREPARATION OF CREAM FORMULATION

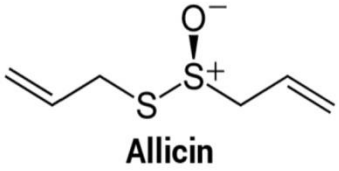
For the formulation of garlic cream firstly take the garlic pieces and crush in the mortal and pestle after the crushing extract the oil from that garlic. Then firstly we will prepared oil phase in that white bees wax, steric acid, stearyl alcohol, and cetyl alcohol where melted and then liquid paraffin were added.

After that we will preparation of aqueous phase water was heated and in that methyl paraben and propyl paraben were added. After that slowly oil phase incorporated into the aqueous phases with maintaining the temperature. Then mixed it for 10- 15 minutes after mixing water and oil phase comes at same temperature then slowly garlic oil is added then put that emulsion for cooling at room temperature to form a semi solid cream[2].

EXTRACTION OF GARLIC OIL

Garlic oil was extracted by the steam distillation method by using apparatus in the laboratory Garlic oil cleaned properly and separately filled in the solvent arranged properly by using condenser and heat.the oil are separated and filled in an airtight container.

Asia, Africa, Europe, and the Mediterranean region.



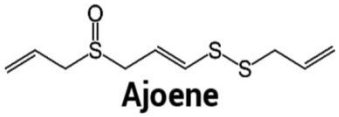


figure no-1main components of garlic.

figure no -2 preparation of garlic cream.

MEDICINAL IMPORTANCE OF *ALLIUM SATIVUM*

The major phytoconstituent that majorly found in *allium sativum* are Allicin and Ajoene and other compound like alliin, Vinyldithiins and flavonids such as quercetin. The main use of garlic has to check the medicinal value for many more years of different microorganisms. antifungal, antiviral, antibacterial, anthelmintic, antiseptic and anti-inflammatory, cardio vascular disease, Cholesterol and lipid-lowering effects, Antithrombotic and anti–platelet aggregatory effects, blood coagulation, fibrinolysis and circulatory effects, garlic and atherosclerosis. Properties of garlic have been well documented. The extracts shown activity against both gram-negative (E. coli, Salmonella species, and Citrobacter Enterobacter, Pseudomonas klebsiella) and gram-positive (*Staphylococcus aureus*, S. pneumonia Group *A streptococcus*, and *Bacillus anthrax*) bacteria causing considerable morbidity worldwide [4]. Garlic has a powerful properties of antibiotic and antifungal.

ANTIMICROBIAL ACTIVITY

Allicin or sulfur is the major compounds which is responsible for the antimicrobial effect of garlic. The antimicrobial properties of garlic were first described by Pasteur in 1958, and since many researches had demonstrated its effectiveness and broad-spectrum antimicrobial activity against many species of bacteria, viruses, parasites, protozoan and fungi. Garlic is more effective with the least side effects as compared to commercial antibiotics; as a result, they are used as an alternative remedy for the treatment of many infections. Medicinal plants of garlic have an antimicrobial property that protects the host from other pathogens and importance of search for natural antimicrobial drugs. Previously conducted researches confirmed that garlic is not only effective against Gram-positive and Gram-negative bacteria but also possesses antiviral and antifungal activities [4].

ANTI-BACTERIAL ACTIVITY

Garlic was mainly used in various centuries and societies to fighting against infectious disease. According to various research study findings, garlic has been proven to be effective against a of acid-fast bacteria gram-positive, gram-negative.

These include Salmonella, Escherichia coli. *Pseudomonas, Proteus, Staphylococcus aureus, Escherichia coli, Bacillus subtulis, Salmonella pp., Klebsiella spp., Micrococcus spp., Clostridium spp*. and *Mycobacterium spp*.The gram-positive *Staphylococcus aureus* was more susceptible to the toxic effects of garlic than its gram-negative counterparts. It shown that bacteria like (*E. coli*, Proteus mirabilis, Shigella spp., and Salmonella spp.,) from stool samples were highly sensitive to garlic.It has been shown that the aqueous extract of garlic can be used alongside conventional antibiotics to fight agents of nosocomial infections in hospitals. In vitro and in vivo study of garlic extract was also effective against Streptococcus mutans which is primary etiological organisms in dental caries.The cloves of garlic and rhizomes of ginger, extracted with 95% ethanol, suggested to have antibacterial activity against multi-drug clinical pathogens and can be used for prevention of drug resistant microbial diseases. Allium sativum (garlic) is also recommended as a treatment for multi-drug resistant tuberculosis. Besides Allicin is pure form found to be and exhibit antibacterial activity against multidrug-resistant enterotoxicogenic strains of *E.coli*.In a study by Lai and Roy, fresh extracts of *Alium sativum* (garlic) and *Nigella sativum* (black cumin) had more antibacterial activity against the Isolates of the urinary tract infection than cefalexin, cotrimoxazole, and nalidixic acid. Garlic, allyl methyl sulfide, has antibacterial activity against the pig pathogen *Actinobacillus pleuropneumoniae* serotype[4].

ANTI-VIRAL ACTIVITY

A garlic sulfur component are verified and gives antiviral activity against Coxsackievirus species, Herpes simplex virus types 1 and 2, Influenza B, Para-influenza virus type 3, Vaccinia virus, Vesicular stomatitis virus, Human immunodeficiency virus type 1 and Human rhinovirus type 2. The order of compounds found in garlic for virucidal activity was, ajoene>allicin>allyl methyl thiosulfate>methyl allyl thiosulfate; no activity was begin for the polar fractions, alliin, deoxy alliin, diallyl disulfide, or diallyl trisulfide. According to different research findings, garlic is an effectual treatment for both the influenza B virus and herpes simplex virus. Two self-supporting researchers in Japan and Romania have found that garlic is able to protect living organisms from the influenza virus and enhanced the production of neutralizing antibodies when given the vaccine.Ajoene, isolated from extracts of garlic may inhibit adhesive interaction and fusion of leukocytes. In investigating study of the effect of allitridin (diallyl trisulfide) on replication of human cytomegalovirus (HCMV) and an expression of viral immediate-early genes, it was revealed that this substance has anti-HCMV efficacy.In another study; it was supposed that the antiviral activity of garlic in humans may be secondary to a direct toxic effect on viruses. It also enhanced the NK-cell (Natural killer-cell) activity that destroys virus-infected cells.On, a doubleblind placebo-controlled study has shown significant protection from the common cold virus and used for reduction of re-infection and treatment of prevention and its benefits from taking allimax powder.

ANTI-FUNGAL ACTIVITY

Different dilutions of extracts of A. sativum have been shown to possess fungistatic and fungicidal activity in vitro and in vivo. Ajoene is an active compound found in garlic which plays a great role as a topical antifungal agent. Garlic has give the action against the fungal disease as equally as the drug ketoconazole, when tested on the fungi *Malassezia furfur, Candida albicans, Aspergillus*, *Cryptococcus* and other *Candida species*. According to the report of Chinese medical journal reports that the use of intravenous(IV) garlic to treat a potentially fatal fungal brain infection called Cryptococcus meningitis.Studies on the effect of amphotericin B (AmB) against Candida. Albicans showed that allicin enhances significantly the effect of AmB against *Candida albicans, Saccharomyces cerevisiae* and against *Aspergillus fumigatus* in Conjugation of antibody-alliinase and *alliin* are effective against murine pulmonary aspergillosis as per in vivo and in vitro study. An in vitro study showed both intrinsic antifungal activity of allicin and its synergy with the azoles group of drugs, in the saponins from *Allium sativum* has been shown against Trichoderma harzianum.Another antifungal protein, allivin, was isolated from *allium sativum* with antifungal activity against Botrytis cinerea, Mycosphaerella arachidicola and Physalospor apiricola. According to the study made in mice, liquid garlic extract was having a substantial effect in reducing the Candida colonies in mice through stimulating the body's own defenses to enhance the phagocytic activity of the cells. For the treatment of ringworm, skin parasites and warts the garlic oil is used and it is applied externally. Lesions that were caused by skin fungi in rabbits and guinea pigs were treated with external applications of garlic extract and began to heal after seven days[4].

ANTI-CANCER ACTIVITY

Among the most prominent and favorable effects of garlic is its effect on the inhibition of the growth of cancer cells. Diallyl trisulphide (DATS) is one of the components of garlic that has a great effect on fighting cancer cells. The cytotoxicity caused by DATS is mediated by the generation of reactive oxygen species (ROS) and subsequent activation of the ROS-dependent caspase pathway in U937 leukemia cells. The action of garlic has been attributed to stimulating immune effector cells including T-cell and natural killer cells.Numerous epidemiological, clinical and laboratory studies have demonstrated that garlic has a great role in cancer prevention especially in relation to digestive tract cancers. The regular intake of garlic decreases the risk of colon, esophagal and stomach cancer. This was thought to be due to the antioxidant effect of allicin in reducing the formation of carcinogenic compounds in the gastrointestinal tract.Garlic has also a variety of anti-tumor effects and chemopreventive effects. In rodents, garlic and its constituents have the property to inhibit the development of chemically produced tumors in the liver, bladder, mammary gland, esophagus, lung, skin, colon, prostate and stomach in both rodent and human studies. The cytotoxicity toward prostate epithelial cells reduced as opposed to PC-3 cancer cells.The toxic effect of garlic indirectly plays an important role in the death of cancer cells. One more key role in the treatment of cancers is garlic's effect on the immune system. Colorectal cancer has leading third cause in the world. Normal garlic cannot be introduced as part of a strict diet. The garlic and low meat diet, however, show a decrease in colorectal tumor growth.According to different research findings, aged garlic extract such as S-allyl cysteine, and S-allylmercapto-L-cysteine exhibited radical scavenging activity. In addition, S-allyl cysteine and some organosufur compounds derived from garlic have been found to retard the growth of chemically induced and transplantable tumors in several animal models garlic my gives protection from cancer Growth and there development [5].

ANTI-HELMINTHIC ACTIVITY

Development of anthelmintic resistance in helminths reported in a number of countries gives a clear indication that control programs based exclusively on their use are not sustainable. The development of integrated programs to control helminths is vital, but such control programs require viable alternatives to the use of anthelmintic.Medicinal plants such as garlic have been used to treat parasitic infections in man and animals. A study showed that allicin is able to produce morphological changes in the male Schistosoma mansoni.The alcoholic extract of bulb of *Allium sativum* has shown activity in vitro anthelmintic activity against human *Ascaris lumbricoldes*. Garlic has been reported to be effective in the exposure of dysentery and possess anthelmintic activity against Entamoeba histolytica and Giardia lamblia. Diallyl trisulfide has in vitro activity against several important protozoan parasites. It demonstrate that the compound has the abilities to be used in the treatment of many human and animal parasitic diseases such as *Trypanosoma species,Entamoeba histolytica and Giardia lamblia*. Garlic oil shows various effects against a broad range of protozoan parasites including *Plasmodium* species, Trypanosoma species, Leishmania species, Giardia species, and Cochlospermum planchonii. Its aqueous extract has also been shown to be effective against hymenolepiasis and giardiasis. In an in vitrostudy, the extracts of *Alium sativum* were shown to have anthelmintic.

ANTI-INFLAMMATORY ACTIVITY

Anti-inflammatory effects are shown by garlic extract. In one study, garlic treatment significantly attenuated inflammation and injury of the liver induced by *Eimeria papillata* infections. *Allicin* is gives to better effect and development of anti-inflammatory drugs with fewer side effects.

ANTI-COAGULANT/FIBRINOLYTIC ACTIVITY

Garlic and other species in the genus allium have played an important role as a prophylactic and therapeutic agent over centuries. Of these, the usefulness of garlic in preventing disease of the cardiovascular system is widely recognized. There are several reports on anticoagulants.In a study, blood anticoagulant substance was isolated from garlic and its physical and chemical properties were also studied.One millitter of blood from coagulating is inhibited by half milligram of garlic extracts. The garlic extract have same therapeutic effect as like potassium oxalate on inhibiting blood clotting.

CARDIOVASCULAR DISEASE

Cardiovascular disease is a complicated disease. Epidemiologic studies have identified these as elevated serum lipids (cholesterol and triglycerides), increased plasma fibrinogen and coagulation factors, increased platelet activation, alterations in glucose metabolism, and smoking. The oxidative modification of low density lipoprotein (LDL) by reactive oxygen species (ROS) are plays important mechanism in the development of atherosclerosis, as is the pathogenesis of hypertension. There is significant use and the evidence supporting

to involvement of blood platelets and the athersosclerosis development.platelet activity has been seen in the various patients such as smokers as well as in patients suffering to the trimoundes injury, vascular injury hypertension as well as hyperlipemia etc.regulates they abnormal lipids and the lipoproteins ,and decrease they platelets aggregation[5].

CHOLESTEROL AND LIPID-LOWERING EFFECTS

Several studies have indicated that garlic and its constituents inhibit key enzymes involved in cholesterol and fatty acid synthesis in cultured rat hepatocytes and human HepG2 cells the enzyme activity have remarkable of garlic and many more constituent and they inhibit HMG-CoA reductase and the monooxygenase enzyme in the human being. In recent study garlic has also been confirmed that inhibition in HMG-Co enzyme reductase. The more water soluble compounds have been shown like as S-allylcysteine (SAC) which is mostly present in the aged garlic extract and the less cytotoxic compounds the lipids soluble sulfur compounds like ajoene and diallyl trisulfide (DATS).

ANTITHROMBOTIC AND ANTI–PLATELET AGGREGATORY EFFECTS

Subsequent thrombus and platlet aggregation formation are remarkable decrease by garlic and its main components. Acetone and chloroform extract have been shown that main effect to inhibit it's main effect directly in free assays in this study, the chloroform extract of garlic was a more effective inhibitor of ADP- and platelet-activating factor (PAF)-induced platelet aggregation.platlet aggregation is decreased it's main garlic constituent has been shown and addressed the last recent study is found in the garlic extract and inhibit it's platletes and it shows the main mechanism.

BLOOD COAGULATION, FIBRINOLYSIS AND CIRCULATORY EFFECTS

Fibrinolysis is also increases by garlic that result in breaking of clots and thrombi. In recent vitro studies have describe that the garlic extract improves blood properties and blood circulation.Blood pressure and vascular tone effects. A garlic extract has been shown the important factor such as relaxing factor and constructing factor and it's shows undiserable effect.g-Glutamylcysteines are compounds found in garlic, and these may decrease the blood pressure, as it gives action by inhibit angiotension-converting enzyme.

RESULTS

The formulation of garlic cream was to mask this unpleasant smell by using that ingredient in the formulation of various oil was used to enhance the preparation and mask the odor of garlic which was also acting as antifungal agent here he utilize of an herbal/bioactive component in a cream (cosmetic) influence its main functions of skins and provide nutrients necessary for the healthy skin aginst antifungal infection. The prepared formulation showed good spread ability, no evidence of phase separation and good consistency during the study period.

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