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Detection of Phytochemical Constituents from oil extract of *Nerium indicum* Leaves

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ABSTRACT

The folklore claims of traditional medicine have been often looking down upon and neglected when compared to western medicine which has scientific foundation. So to prevent slow extinction of this system of medicine efficacy, safety and authenticity of drugs used has to be carried out through phytochemical and pharmacological screening. In the present study the main focus is to prepare and screen the traditionally used linseed oil extract obtained from *Nerium indicum* leaves for various categories of phytoconstituents. The standard procedures were followed in order to determine the presence of secondary metabolites. The results obtained are indicating the presence of phytochemical compounds such as alkaloids, flavonoids, tannins, cardiac glycosides and sterols in the linseed oil extract of *Nerium indicum* leaves. From the results obtained, it can be concluded that *Nerium indicum* oil extract contains a number of bioactive constituents which may be responsible for therapeutic activities claimed by traditional herbal practitioners.

KEY WORDS: *Nerium indicum* oil extract, Phyto-chemical screening, Secondary metabolites, Traditional medicine.

INTRODUCTION

Since, many years Plants are being used for treating infections around the globe in various civic establishments. These are taken either alone or in blend (multidrug) as pills, powders, extracts, ointments, glues, oils and etc. Most of the pharmaceutical research studies of this era are done on plant extracts, powders and their dosage forms like tablets, suspensions, creams and capsules, but very rare and negligible on medicinal oils despite huge numbers are used in various traditional medical systems and folklore medical practices.

Medicated oil are prepared by prolonged boiling of oil with pasty mass or decoction or fresh plant parts. During the process of preparation, oil captures various secondary metabolites and in other circumstances the metabolites may react with compounds of oil and may form byproducts (new compounds) that possess pharmacological effects. For detecting chemical composition of oil extract in accurate way, the preparation should be worked out according to the exact ethno-medicinal practice. Many Medicated oils are being used by folk practitioners in and around our area (Bhuvangiri district) and one among them is oil extract of *Nerium indicum* leaves which is used for treating various skin diseases.

Neriumindicum Linn is popularly known as the karavira and used as one of the most important drug in Traditional System of Medicine. Pharmacological studies on this plant reported anti-nociceptive, anti-

inflammatory, anti-microbial, diuretic, CNS depressant, anti-cancer, anti-diabetic, immunomodulatory and larvicidal activities. Phytochemical studies on different plant parts of *Nerium indicum* reported to contain cardiac glycosides, alkaloids, flavones, triterpenoids, steroids, a resin, tannins, glucose, ursolic acid, α-tocopherol, an essential oil and rich of minerals. However, phytochemical analysis has not been reported on oil extract of *Nerium indicum* leaves till date. Hence, the present study deals with the detection of phyto-constituents in traditionally prepared oil extracts of *Nerium indicum* leaves.

MATERIAL AND METHODS

Sample collection: The *Nerium indicum* fresh leaves were collected from the medicinal garden of Vignan institute of pharmaceutical sciences, Vignan hills, Deshmuki, Abdulapurmet, Bhuvangiri district, Telangana State, India in the month of February 2017 by the authors. Plant sample was identified by botanist and the voucher specimen has been deposited in the department of pharmacognosy of our college. Edible Linseed oil for preparing traditional used extract of *Nerium indicum* leaves was procured from general stores in Dil-sukhnagar, Hyderabad. All the chemicals, glass ware and equipments used in this study were obtained from the central store house of the institution. The chemicals were of analytical grade and glass ware of borosilicate type.

Sample extraction: Over a water bath of simmering water, place the 1 liter glass beaker with the whole fresh leaves and oil in the 1:10 portions. Heat the composition gradually over low heat for about three hours or till the fresh *Neriumindicum* leaves turn brown. During this process, make sure the water in the water bath does not evaporate completely. Next, filter the oil, let it cool, and transfer the oil into amber colored glass bottle with airtight cap. Store it in a dark, cool place until further use.

Phytochemical screening: The oil extract of *Nerium indicum* leaves were subjected to qualitative chemical screening for detection of various classes of chemical constituents. The methods followed were of Odebiyi and Sofowora(1999).

RESULTS AND DISCUSSION

The result of the present study is presented in Table 1. as follows;

Table.1. Phytochemical screening of linseed oil extract of *Nerium indicum* leaves

Chemical Tests	Linseed Oil Extract
Test for tannins	
Ferric chloride test	+++
Lead acetate Test	+++
Gelatin Test	+++
Bromine water test	+++
Acetic acid solution test	---
Potassium dichromate test	---
Dil. Iodine solution test	---
Dil. HNO_3 test	---
Dil. NH_4OH & Pot. Ferricyanide solution test	---
Dil. $KMNO_4$ test	+++
Test for Saponins	
Frothing test	----------
Test for Alkaloids	
Dragendorff's reagent	+++
Mayer's reagent	+++
Hager's reagent	+++
Wagner's reagent	+++
Tannic acid Test	+++
Test for cardiac glycosides	
Baljet Test	+++
Raymonds Test	--------
Test for steroids	

Liebermann-Burchard's test	+++
Salkowski's test	+++
Test for flavonoids	
Shinoda's reaction test	+++
pew's test	+++
Lead acetate test	-------
Addition of sodium hydroxide	+++
Test for anthraquinones	
Borntrager's reaction	----------

It is well established by research studies that nutrient deficiency, allergens, microbes, excess free radical generation and inflammation are involved in the development and aggravation of skin diseases. So for successful treatment of the skin diseases need a combination of drugs which can alleviate all these above factors. So plants possessing compounds which antagonize the effects of these agents should be identified and the traditional system of medicine is one such important source as it is well recognized all over the world for treating chronic ailments like skin diseases.

Folklore practitioners of Nalgonda and Yadadri-Bhuvangiri district use oil extract of *Nerium indicum* leaves for treating various skin diseases. It was subjected to phytochemical screening which revealed the presence of flavonoids, tannins, cardiac glycosides, alkaloids and steroids. Previously reported pharmacological activities of secondary metabolites of *Nerium indicum* leaves are compiled in Table 2 as follows:

Table 2. Reported Pharmacological activities of Secondary metabolites of *Nerium indicum* leaves

S. No.	**Name of the Secondary Metabolite**	**Role of the Secondary Metabolite in skin diseases**
1	Plant polyphenols (Tannins and flavonoids) [17,18]	antioxidant, anti-inflammatory, antimicrobial
2	Cardiac glycosides[19,20]	Suppress the activation of Nuclear Factor kappa-light-chain-enhancer of activated B cells. (NF-κB)
3	Alkaloids[21,22]	Antibacterial
4	Steroids[23]	Antibacterial, anti-inflammatory,

Tannins topically act by coagulating the surface proteins of cells and exudates, thereby reducing permeability and secretion. Several scientific research studies have reported that plant phenols like tannins and flavonoids act as free radical scavengers, antimicrobial, anti-allergic and anti-inflammatory agents. Since these compounds were found to be present in the oil extract *of Nerium indicum* leaves, it might be responsible for the effective healing of skin diseases.

Cardio-active drugs are used in the treatment of congestive heart failure and cardiac arrhythmia. However a patent has been granted for treatment of skin diseases by cardiac glycosides. U.S. Patent Application No. 2006/0205679 relates to topical and oral formulations of cardiac glycosides for treating skin diseases. The oil extract of *Nerium indicum* leaves also contains cardiac active glycosides and it is used in traditional system of medicine in treatment of skin diseases. Hence cardiac glycosides present in the oil extract of *Nerium indicum* leaves may also be responsible for healing of skin diseases.

Leaf alkaloidal extracts of *Nerium indicum* have been reported by several researchers to possess antiinflammatory, antimicrobial, pesticide etc. In present study oil extract of *Nerium indicum* leaves also contains alkaloids which may be responsible for healing of skin diseases by acting on inflammation and microbes.

Hence, the presence of different phytoconstituents of *Nerium indicum* leaves and the phytoconstituents of linseed oil together have synergistic effect on the healing of various skin diseases.

CONCLUSION

The traditional used *Nerium indicum* leaf oil extract contains number of bioactive compounds such as tannins, flavonoids, cardiac glycosides, alkaloids and steroids which may responsible for the therapeutic effects claimed by folklore practitioners.

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