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PRELIMINARY PHYTOCHEMICAL SCREENING OF *Tylophora indica*

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ABSTRACT

Preliminary screening of phytochemicals is a valuable step, in the detection of the bioactive principles present in medicinal plants and subsequently may lead to drug discovery and development. In the present study, chief phytoconstituents of the*Tylophora indica* were identified in order to relate their presence with bioactivities of the plants. Screening of leaves of*Tylophora indica*was performed for the presence of Alkaloids, Anthraquinones, Glycosides, Coumarins, Flavonoids, Saponins, Steroids, Terpenoids and Tannins using standard methods. The selected plant was found to contain Flavonoids, Alkaloids, Terpenoids and Phenolic compounds in good quantity and also other phytochemical constituent like Anthraquinones, Glycosides, Coumarins, Saponins, Steroids and Tannins are found in moderate quantity. Hence, the above plant extract could be explored for its highest therapeutic efficacy by pharmaceutical companies in order to develop safe drugs for various ailments.

Keywords*:* *Tylophora indica*,Medicinal plants, Preliminary, Screening, Phytochemical.

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INTRODUCTION

Natural products are a source of many traditional medicines and even some synthetic herbal medicines.In some parts of the world the herbal medicines are commonly used to treat a number of diseases. The alternate systems of medicine such as Unani, Siddha and Ayurveda comprise of the natural products[1]. The modern Herbal medicines have been widely used all over the world. The pharmaceutical industry itself still relies largely on the diversity of secondary metabolites in plants. The synthesized aromatic substances (metabolites) are used by plants as defensive weapon against predation by microorganisms, insects and herbivores. The search for the alternative systems of medicines having potential anti-inflammatory, antibiotic and other activities has gained an importance considering the harmful side effects which the modern synthetic medicine has[2].*Tylophora indica* (commonly known as Antmul) previously called as *Tylophora asthamatica*, is a well-known medicinal plant belongs to the family Asclepiadaceae. It is used for the treatment of asthma bronchitis, whooping cough, inflammation, allergies, dermatitis, dysentery, diarrhoea and rheumatic gouty pains. It is also a folk remedy for psoriasis, seborrhoea, anaphylaxis, and leukopenia. *Tylophora indica* is a perennial, slightly woody, not much branched, climbing shrubdistributed throughout southern and eastern part of India in plains, forests, and hilly places. It gives off numerous long fleshy roots. Its stems are slender, twining, tortuous, terete, reaching 10-12 feet in length. The leaves are broadly ovate, rounded or cordate.The roots have a fairly sweet and subsequently acrid taste, aromatic odour and a brittle fracture.

The powdered leaves, stem, and root contain several phenanthroindolizidine alkaloids including tylophorine (an anti-inflammatory agent), tylophorinine, tylophorinidine and tyloindicine I (potential anticancer alkaloids). The alkaloids are analgesic, smooth muscle relaxant and have hepato-protective activity against induced hepatotoxicity. It is used for its antitumor, anti-inflammatory, anti-anaphylactic properties and is also used to treat jaundice in certain parts of India[3-14].

Plants have a great potential for producing new phytochemicals with profound antimicrobial activity against human pathogens. According to the world health organization (WHO), more than 80% of the world's population depends on traditional medicine for their primary health care needs[15]. There is an upsurge of resistant microbial strains to conventional antimicrobials

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necessitating the need for a search and development of new drugs to circumvent the problem [16].

Fig.1 ***Tylophora indica***

MATERIALS AND METHODS

Plant collection:

The leaves of *Tylophora indica* were collected from Ratangad, Near Bhandardara Reservoir and was identified and authenticated by Dr. Mahendra Khyade, Department of Botany, Sangamner College, Sangamner.

Preparation of Plant extract:

The collected leaves were first washed in tap water and dried then cut into small pieces and again washed in distill water. Then leaves were left for air drying under shade. After air drying the leaves was grinded in mechanical grinder and powdered material was kept in airtight container for further use. The sample powder was extracted by using preferred solvent. Crude extract were kept in small bottles for phytochemical screening.

Phytochemical screening of the extracts:

A small portion of the dry extract was subjected to phytochemical test for alkaloids, glycosides tannins, flavonoids, steroids and Saponins, terpenoids, phenols[17-18].

a) Test for Alkaloids

Exactly 0.5 g of the plant extract was dissolved in 5 mL of 1% HCl on steam bath. A milliliter of the filtrate was treated with drops of Dragendorff's reagent. Turbidity or precipitation was taken as indicative of the presence of alkaloids**.**

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b) Test for Anthraquinones (cardenolides)

Few Extract of plant acidify with acetic acid. Acid solution was extracted with chloroform. To the chloroform layer, ammonia was added. Ammonia layer turn pink. This shows the presence of anthraquinones containing free carboxyl group.

c) Test for Cardiac Glycosides

To the extract of plant 10% solution of NaOH & 0.3 % solution of nitro prusside were added. Appearance of transient pinkish red colouration indicates presence of cardenolides.

d) Test for Tannins

About 1 g of the extract was dissolved in 20 mL of distilled water and filtered. Two to three drops of 10% $FeCl_3$ were added to 2 mL of the filtrate. The production of a blackish-blue or blackish-green colouration was indicative of tannins. To another 2 mL of the filtrate was added 1 mL of bromine water. A precipitate was taken as positive for tannins.

e) Test for Flavonoids (Shinoda tests)

To the extract of plant, a piece of magnesium ribbon & hydrochloric acid were added. With flavonoids pink colour developed.

f) Test for Saponins

Two grams of the extract was boiled in 20 mL of distilled water in a water bath and filtered. Approximately 10 mL of the filtrate was mixed with 5 mL of distilled water and shaken vigorously for a stable persistent froth. The frosting was mixed with 3 drops of olive oil and shaken vigorously, then observed for the formation of an emulsion.

g) Test for Steroids

About 0.5 g of the extract was dissolved in 3 mL of $CHCl_3$ and filtered. Concentrated H_2SO_4 was added to the filtrate to form a lower layer. A reddish brown colour was taken as positive for steroid ring.

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Table1: Preliminary phytochemical screening of leaves of *Tylophora indica*

Sr. No.	Phytochemical Tests	Observations
1.	Alkaloids	+++
2.	Anthraquinones	+
3.	Cardiac glycosides	+
4.	Coumarins	+
5.	Flavonoids	+++
6.	Saponins	+
7.	Tannins	-
8.	Steroids	+
9.	Phenolic	++
10.	Terpenoids	++

+++: Present in large quantity; ++: Present in moderate quantity and -: absent

RESULT AND DISCUSSION

The phytochemical screening of crude extract of leaves of *Tylophora indica* reveals that selected medicinal plants is the source of the secondary metabolites i.e. alkaloids, flavonoids, terpenoids, glycosides, Saponins.

These secondary metabolites contribute significantly towards thebiological activities of medicinal plants such as hypoglycemic,antidiabetic, antioxidant, antimicrobial, anti-inflammatory,anticarcinogenic, antimalarial, anticholinergic, antileprosy activities etc[19.]

Flavonoids are present theplant extract as a potent water-soluble antioxidant and free radical scavenger, which prevent oxidative cell damage and also have strong anticancer activity [20-21.] It also helps in managing diabetes induced oxidative stress. Terpenoids have been found to be useful in the prevention and therapy of several diseases, including cancer. Terpenoids are also known to possess antimicrobial, antifungal, antiparasitic, antiviral, anti-allergenic, antispasmodic, antihyperglycemic, anti-inflammatory and immunomodulatory properties[22-23.]

In addition, terpenoids can be used as protective substances in storing agriculture products as they are known to have insecticidal properties as well[24].Alkaloids are also found to be present in plant extract which represent a class that affects the central nervous system, reduces appetite and behaves as diuretic[25].Glycosides and Coumarins are also found to be present which exert beneficial action on immune system by increasing body strength and hence are valuable as dietary supplements. Coumarins can be suggested to be beneficial for hyperproliferative skin diseases on the basis of their antimicrobial and anti-inflammatory effects[26]. Glycosides also have vast therapeutic efficacy as they are found in almost every medicinal plant.

CONCLUSION

Phytochemical Screening of *Tylophora indica* clearly reveals that the maximum classes of phytoconstituents are present in its extract. Hence, the above plant extract could be explored for its highest therapeutic efficacy by pharmaceutical companies in order to develop safe drugs for various ailments. Since these plants have been used in the treatment of different diseases, the medicinal roles of these plants could be related to such identified bioactive compounds. The quantitative analyses of these phytocompounds will be an interesting area for further study. Efforts should be geared up to exploit the biomedical applications of this screened plant due to the presence of certain class of phytocompounds for their full utilization.

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