IJPSR (2013), Vol. 4, Issue 3 **(Research Article)**

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 27 November, 2012; received in revised form, 13 January, 2013; accepted, 25 February, 2013

PHYTOCHEMICALS INVESTIGATION AND TLC ANALYSIS OF *JASMINUM MULTIFLORUM* LEAVES

Sunil H. Ganatra*, Shweta P. Durge and Archana M. Ramteke

Department of Chemistry, Institute of Science, R. T. Road, Civil Lines, (Affiliated to Rashtrasant Tukdoji Maharaj Nagpur University), Nagpur, Maharashtra, India

Keywords:

Jasminum multiflorum, *Oleaceae*, Phenols, Phytochemicals, TLC Profile

Correspondence to Author:

Dr. Sunil H. Ganatra

Associate Professor, Department of Chemistry, Institute of Science, Nagpur – 440008, Maharashtra, India

E-mail: sunilganatra@gmail.com

ABSTRACT: *Jasminum multiflorum* belongs to the *Oleaceae* family. It is used as a traditional medicine from ancient times. It is a large evergreen twinner shrub found throughout India. Present study reports the phytochemical properties which have been carried out on the leaves extract using ethanol, methanol, ethyl acetate, acetone and n-hexane. The phytochemicals analysis show the presence of Phenols, Saponins, Terpenoids etc; TLC has been carried out on different extracts of leaves of *Jasminum multiflorum*, which have shown different R_f values. The presences of phenols, terpenoids and saponins based phytochemicals are reported.

INTRODUCTION: Plants have always been a rich source of natural compounds. In the past traditional people depend on local flora and fauna for their survival. They use leaves, roots, and fruits as traditional medicine. The metabolites discovered in medicinal plants may avoid the side effects of synthetic drugs because they accumulate within living cells.

Natural products are phytochemicals that occur naturally in plants. These phytochemicals are responsible for colour and organoleptic properties, such as the deep purple of blueberries and smell of garlic. The term is generally used to refer to those chemicals that may have biological significance but are not established as essential nutrients [1].

Scientists estimate that there may be as many as 10,000 different phytochemicals having the potential to affect diseases such as cancer, stroke or metabolic syndrome. These phytochemicals are abundant in fruits, vegetables and herbs.

Jasminum multiflorum is a species of Jasmine in the family *Oleaceae* and is commonly known as winter jasmine, Indian jasmine, Downy jasmine (English), Kundah or Magha mallika (Sanskrit), and Kundphul (Hindi) and Kunda (Marathi).

It is an evergreen, twinner shrub with young branches clothed with velvety pubescence; leaves are simple, ovate, opposite, base rounded or chordate. Flowers are fragrant seen in terminal and axillary cymes. It is an ornamental plant which is primarily cultivated for decoration, adornment to enhance the appearance of houses, gardens etc [2, 3, 4]. It is also a source of fragrant oil for perfume making and cosmetics [5, 6]. Classification of the plant is given in **table 1.**

TABLE 1: CLASSIFICATION OF *JASMINUM MULTIFLORUM*

Kingdom	Plantae
Subkingdom	Tracheobionta
Superdivision	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Order	Scrophulariales
Family	Oleaceae
Genus	Jasminum
Species	*Jasminum multiflorum*

However, this plant species have found use in medicine and still very little literature exist on its chemical biological activities [2, 7].

The whole plant is having medicinal properties. Dried leaves are good for indolent ulcers [8]. Secoiridoid lactones i.e. Jasmolactones A, B, C, D are also isolated which contains a novel bicyclic2-oxo-oxepano[4,5-C]pyran ring from ariel parts [9] and secoiridoid glycosides, multifloroside, multiroside and 10-hydroxyoleoside-11 methyl ester have been isolated from *J. multiflorum* and these secoiridoid glycosides and lactones were found to have coronary dialating and cardiotropic activities [10].

EXPERIMENTAL:

Plant material: The leaves of *Jasminum multiflorum* were collected from Nagpur, Maharashtra, washed properly and shade dried. The dried leaves powdered and used for the extraction purpose.

Extract preparation: The dried leaves powder (25 gm.) was extracted in Soxhlet apparatus by using 25 ml of different solvents having different polarities like Ethanol, Methanol, Ethyl acetate, Acetone and n-Hexane for 48 hours and then concentrated by evaporation. These prepared extracts were used for phytochemicals analysis.

Phytochemicals investigation: Number of phyto-chemicals tests performed using obtained extracts. These procedures are already reported by number of workers and used without any modification [11, 12, 15, 16]. The name of phytochemicals and their investigation methods are as follows:

1. **Cardiac glycosides:** 5 ml of extract was treated with 2 ml of glacial acetic acid containing a drop of $FeCl_3$ solution. This was then underplayed with 1 ml conc. H_2SO_4. A brown ring of the interface indicates a deoxy sugar characteristic of Cardenolides.

2. **Flavonoids:** To 1ml of extract, a few drops of dilute NaOH was added an intense yellow colour was produced in the plant extract which becomes colourless on addition of few drops of dilute acid indicates the presence of flavanoids.

3. **Terpenoid:** 5 ml of each extract was mixed with 2 ml of chloroform; 3 ml of concentrated H_2SO_4 was then added to form a layer. A reddish brown precipitate colouration at the interface formed indicated the presence of terpenoids

4. **Tannin:** 1 ml of 5% ferric chloride to solvent free extract is added. The presence of tannin is indicated by the formation of bluish black or greenish black precipitate [12].

5. **Saponin:** The extract was diluted with 20ml distilled water and was agitated in a graduated cylinder for 15 min. the formation of 1cm layer of foam indicates the presence of saponin [12].

6. **Phenol:** 1ml of extract 2ml of distilled water was added followed by few drops of 10% $FeCl_3$ appearance of blue or green colour indicates presence of phenols.

7. **Quinone:** 1ml of extract and 1ml of concentrated H_2SO_4 was added. Formation of red colour shows the presence of quinones.

8. **Steroid:** 1ml of extract dissolved in 10 ml chloroform and equal volume of concentrated H_2SO_4 added by sides of test tube. The upper layer turns red and sulphuric acid layer shown yellow with green fluorescence. This indicated the presence of steroids.

The presences of various phytochemicals in prepared extracts are reported in **table 2**.

TLC analysis of leaves extracts of *Jasminum multiflorum*: The Thin layer chromatography (TLC) performed for all five extracts on analytical plates over silica gel-G of 0.2 mm thickness. These plates were developed in three different mobile phases as described in literatures and their composition is listed in **Table 3** [13, 14].

The spots were visualized by exposing plates to Iodine vapour. **Figure 1** shows the TLC photographs and **table 4** shows the calculated R_f values for all studied TLC systems [17, 18, 19, 20].

TABLE 2: PHYTOCHEMICAL ANALYSIS OF DIFFERENT EXTRACTS OF *J. MULTIFLORUM* LEAVES

Phytochemicals	Extract				
	Ethanol	Methanol	Ethyl acetate	Acetone	n-Hexane
Phenol	+	+	+	-	-
Flavonoid	-	-	-	-	-
Quinones	-	-	-	-	-
Tannins	-	-	-	-	-
Saponins	-	+	-	-	-
Cardiac glycosides	-	-	-	-	-
Terpenoids	-	-	+	+	-
Steroids	-	-	-	-	-

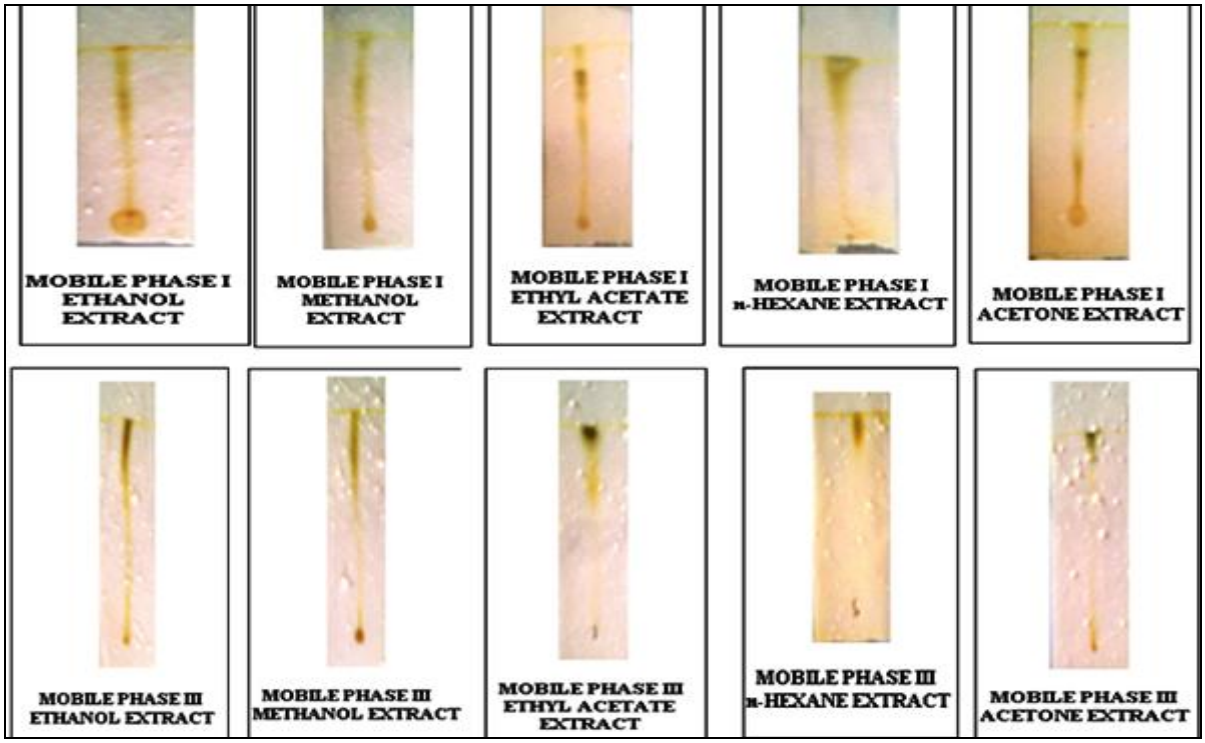
Where (+) = Present, (-) = Absent

TABLE 3: MOBILE PHASES AND THEIR COMPOSITIONS

Mobile Phase Number	Mobile Phase	Composition
I	n-Hexane : Ethyl Acetate : Formic Acid	31:14:5 [13]
II	n-Hexane : Ethyl Acetate : Acetic Acid	31:14:5 [13]
III	Chloroform : Ethyl acetate : Formic Acid	5:4:1 [14]

TABLE 4: TLC OF *JASMINUM MULTIFLORUM* LEAVES

Plant Extract	R_f Values		
	Mobile Phase I	Mobile Phase II	Mobile Phase III
Ethanol	0.19 0.73	0.94	0.91
Methanol	0.85 0.54	0.89 0.69	0.83
Ethyl acetate	0.88 0.78 0.64	0.89 0.84	0.95
Acetone	0.85 0.56 0.29	0.87 0.78 0.65	0.93
n-Hexane	0.93	0.86	0.92



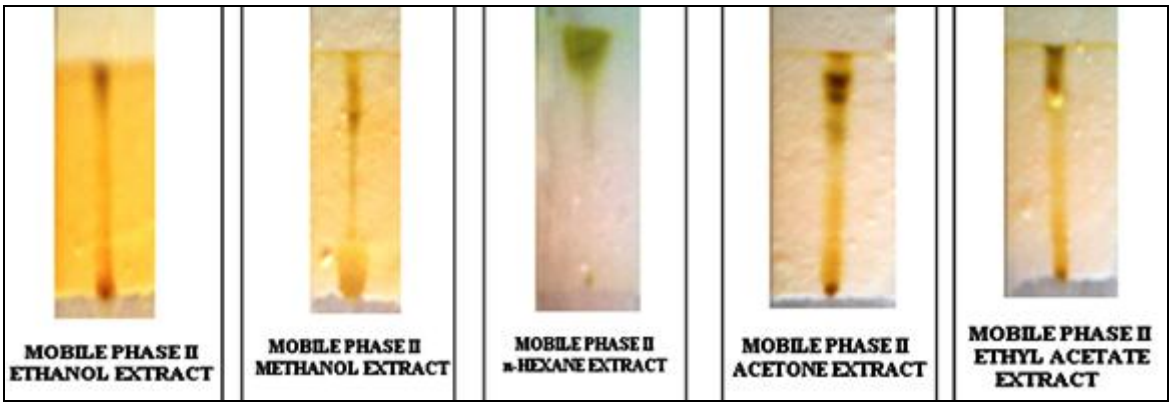


FIGURE 1: PHOTOGRAPHS OF TLCS OF *JASMINUM MULTIFLORUM* LEAVES EXTRACT

RESULTS: Leaves extracts of *Jasminum multiflorum* were prepared in n-hexane, acetone, ethyl acetate methanol and ethanol solvents. Numbers of phytochemical tests were performed and their results are reported in Table 2. It is reported that different leaves extract shows presence of Phenols, Terpenoids and Saponins as a main phytochemicals.

The presence of different phytochemicals in leaves extract is also suggested by the TLC analysis. The R_f values in three different mobile phases for various extracts are reported in Table 4. Figure 1 shows photographs of the studied TLC slides.

DISCUSSION: Different phytochemicals tests performed on the extracts of *Jasminum multiflorum* leaves show the presence of phenols, terpenoids and saponins. Phenols are reported in number of extracts viz ethanol, methanol and ethyl acetate. Terpenoids reported in ethyl acetate and acetone extracts. Saponins are reported only in methanol extract. From the results, it is concluded that phenols based phytochemicals are present in abundance in the *Jasminum multiflorum* leaves.

TLC analysis shows well separation of the compounds and also suggests the presence of different kinds of phytochemicals in leaves extract.

CONCLUSION: The different phytochemicals tests performed on the extracts of *Jasminum multiflorum* leaves show the presence of phenols in ethanol extract, phenols and saponin in methanol extract. In case of ethyl acetate it shows the presence of phenol and terpenoids.

Acetone extract shows presence of terpenoids only whereas n-hexane extract reported no sign of phytochemicals. These findings on leaves of *Jasminum multiflorum* show presence of phenols in abundance, terpenoids in moderate amount and saponins in fewer amounts.

Jasminum multiflorum leaves can be analyzed further to find out the possibilities of using it as herbal medicine on a scientific basis.

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How to cite this article:
Ganatra SH, Durge SP and Ramteke AM: Phytochemicals investigation and TLC analysis of *Jasminum multiflorum* leaves. *Int J Pharm Sci Res* 2013; 4(3); 1135-1139.