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Research Article

**DETERMINATION OF FLAVONOIDS IN HERBAL  
EXTRACT USING THIN LAYER CHROMATOGRAPHY**Shashibhushan Ram, Dr. Vivekanand Katare\*<sup>1</sup>, Ms. Nisha Kalme<sup>1</sup>, Dr. Prabhat Kumar Jain<sup>2</sup><sup>1</sup>Vivekanand College of Pharmacy, Bhopal (M.P.), <sup>2</sup>Scan Research Laboratories, Bhopal (M.P.)**Article Received:** December 2022    **Accepted:** December 2022    **Published:** January 2023**Abstract:**

*The use of plants for healing purposes predates recorded history and forms the origin of much of modern medicine. Gardenia latifolia (Rubiaceae) is commonly known as Indian boxwood or Ceylon boxwood, is a densely foliaceous small tree that occurs throughout the greater parts of Indian common in deciduous forests along the streams. Many beneficial medicinal products are used to treat various serious diseases and disorders like diabetes, cancer and cardiovascular diseases without side effects. Hence this study focused to investigate the phytochemical analysis, and identification of flavonoid compound using thin layer chromatographic technique. The plant was collected and subjected to the extraction process by Maceration method. Hydroalcoholic solvent was used for the extraction process. The results showed that the yield of extracts obtained from sample using hydroalcoholic as solvents was found to be 8.52 %. The phytochemical analysis revealed the presence of proteins, diterpins and saponins. Thin layer Chromatography was performed The Rf value of quercetin was found 0.86 indicates the presence of flavonoids in hydroalcoholic extract of Gardenia latifolia. Thus, it can be concluded that the plant consist of flavonoid component which can be used to treat various diseases and disorders.*

**Key Words:** Herbal Medicine, Gardenia latifolia, Flavonoid, Thin Layer Chromatography**Corresponding author:****Vivekanand Katare,**

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**INTRODUCTION:**

Herbal medicine, or phytotherapy, is the science of using herbal remedies to treat the sick. It therefore covers everything from medicinal plants with powerful actions, such as Digitalis and Belladonna, to those with very gentle action, such as chamomile, mint and many others. It should be noted that 'very gentle' action, when referring to chamomile or mint, does not mean they are more or less ineffective, but rather that one would not expect these plants to produce instant and powerful effects like those seen, for instance, after an injection of digitalis or strophanthin<sup>1</sup>. Medicinal plants used traditionally, are now moving from fringe to mainstream as people are becoming more aware of therapeutic properties of these medicinal plant resources and their products in maintaining health and preventing diseases [1].

Flavonoids represent the single, most widely occurring group of phenolic phytochemicals. Recent work is beginning to highlight the potential health beneficial properties of the flavonoid and polyphenolic components of the diet, known to be powerful hydrogen-donating antioxidants and scavengers of reactive oxygen and reactive nitrogen species in vitro. Flavonoids are classified according to the oxidation level of their central C ring. These variations define the families of anthocyanidin, flavone or flavonol (i.e. 3-hydroxyflavone), flavanone and proanthocyanidin oligomers of the monomeric flavan-3-ols. All fruit, vegetables, beverages and grains are rich in a variety of phenolic families, in particular, the (epi)catechin flavanol constituents and their oligomers of teas, red wine, apples and chocolate, the hydroxycinnamate components of all fruit and some vegetables, the anthocyanins in berry fruit and the flavone/flavonols in a number of fruit and vegetable. Most flavonoids are glycosylated in their natural dietary forms with the exception of the catechins [2].

*Gardenia latifolia*, commonly known as Indian boxwood or Ceylon boxwood, is a small tree with dense foliage. The different parts of this plant are reported to be used in treatment of a wide range of ailments such as snake bite, skin diseases, stomach pains, inflammatory pain, caries, haemorrhage in humans and ephemeral fever in live stocks. Due to its broad spectrum healing potential, this medicinal tree

exhibits itself as a very good research material for various scientific studies [3].

Thin layer chromatography (TLC) is a chromatography technique used to separate mixtures. Chromatography was discovered by M. Tswett in 1906. Thin layer chromatography is performed on a sheet of glass, plastic, or aluminum foil, which is coated with a thin layer of adsorbent material, usually silica gel, aluminum oxide, or cellulose (blotter paper). This layer of adsorbent is known as the stationary phase. After the sample has been applied on the plate, a solvent or solvent mixture (known as the mobile phase) is drawn up the plate via capillary action. Because different analytes ascend the TLC plate at different rates, separation is achieved [4].

**MATERIAL AND METHODS:****Collection of Plant material:**

Leaves of *Gardenia latifolia* were collected from local area of Bhopal in the month of September, 2022.

**Method:****Extraction by maceration process:**

40 gm of dried powdered leaves of *Gardenia latifolia* has been extracted with hydroalcoholic solvent (methanol: water: 40:40) using maceration process for 48 hrs, filtered and dried using vacuum evaporator at 40°C.

**Phytochemical screening:**

Phytochemical examinations were carried out for all the extracts as per the standard methods.

**Qualitative chromatographic analysis****Thin Layer Chromatography**

Thin layer chromatography: T.L.C. is based on the adsorption phenomenon. In this type of chromatography mobile stage containing the dissolved solutes passes over the exterior of stationary phase.

**RESULTS AND DISCUSSION:**

The yield of extracts obtained from sample using hydroalcoholic as solvents was found to be 8.52 %. The phytochemical screening results showed the presence of proteins, diterpins and saponins. The R<sub>f</sub> value of quercetin was found 0.86 indicates the presence of flavonoids in hydroalcoholic extract of *Gardenia latifolia*.

**Table 1: % Yield of leaves of *Gardenia latifolia***

S. No.	Solvents	% Yield
1.	Hydroalcoholic	8.52%

**Table 2: Phytochemical screening of extract of leaves of *Gardenia latifolia***

S. No.	Constituents	Hydroalcoholic extract
1.	<b>Alkaloids</b> Mayer's Test Wagner's Test Dragendroff's test Hager's test	-ve -ve -ve -ve
2.	<b>Glycosides</b> Modified Borntrager's Test Legal's test	-ve -ve
3.	<b>Flavonoids</b> Lead acetate Alkaline test	-ve -ve
4.	<b>Phenolics</b> Ferric Chloride Test	+ve
5.	<b>Proteins and Amino acids</b> Xanthoproteic test Ninhydrin Test	+ve -ve
6.	<b>Carbohydrates</b> Molisch's Test Benedict's Test Fehling's test	-ve -ve -ve
7.	<b>Saponins</b> Froth Test Foam test	+ve +ve
8.	<b>Diterpins</b> Copper acetate test	+ve
9.	<b>Tannins</b> Gelatin Test	-ve

**Table 3: TLC of leaves of *Gardenia latifolia***

S. No.	Extract	Rf Value
	Mobile phase (Toluene: Ethyl acetate: Formic acid; 5:4:1)	
1.	Quercetin <i>Leaves of Gardenia latifolia</i>	0.86
	Long UV	0.62, 0.86
	Short UV	0.26, 0.62, 0.86
	Normal light	0.86

**CONCLUSION:**

*Gardenia latifolia* is commonly known as Indian boxwood or Ceylon boxwood, is a densely foliaceous small tree that occurs throughout the greater parts of India common in deciduous forests along the streams. Different parts of *Gardenia latifolia* Ait. are used traditionally for the treatment of various ailments like rheumatism, cuts, wounds, diarrhea, dysentery, remedy for indigestion in children etc. The bark is useful in treating various skin diseases.

% Yield of leaves of *Gardenia latifolia* was found to be 8.52%. Table 2 showed the presence of phytochemicals in *Gardenia latifolia* namely

proteins, diterpins and saponins. The Rf value of quercetin was found 0.86 indicates the presence of flavonoids in hydroalcoholic extract of *Gardenia latifolia*.

**REFERENCES:**

1. Meuss A. Herbal medicine. Curr. Sci. 2000;78:35-9.
2. Rice-Evans C. Flavonoid antioxidants. Current medicinal chemistry. 2001 Jun 1;8(7):797-807.
3. Sundar RA, Habibur RC. Pharmacognostic, phytochemical and antioxidant studies of *Gardenia latifolia* Aiton: An ethnomedicinal tree

- plant. Int. J. Pharmacogn. Phytochem. Res. 2018;10:216-28.
4. Poole CF. Thin-layer chromatography: challenges and opportunities. Journal of Chromatography A. 2003 Jun 6;1000(1-2):963-84.