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SHORT COMMUNICATION

Preliminary Phytochemical Screening of *Delonix elata* Linn. Leaf Extracts

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Abstract

The objective of the present study was to investigate the preliminary phytochemical constituents of *Delonix elata* Linn. leaf extracts. *Delonix elata* leaf was dried, powered and extracted with various solvents namely aqueous, ethanol, acetone, petroleum ether and chloroform. The crude extract was then analyzed for its phytochemical constituents using standard methods. Phytochemical screening detected the presence of active ingredients such as tannins, saponins, quinones, terpenoids, steroids, flavonoids, phenols, alkaloids, cardiac glycosides, coumarins and betacyanin in the leaf extracts. Among the 13 phytochemical constituents tested, the ethanolic extract showed positive to all secondary metabolites except glycosides and anthocyanin, whereas, other solvents showed more activity in the order of aqueous, petroleum ether, chloroform and acetone.

Keywords: Phytochemicals, *Delonix elata*, leaf extracts, aqueous extract, ethanolic extract.

Introduction

Medicinal plants are anciently used for the treatment of human diseases since thousands of years (Momin and Kadam, 2011). The active constituents of the plants had specific compounds which had greater therapeutic benefits. Many researchers have already revealed the presence of phytochemicals namely alkaloids, flavonoids, steroids, phenols, glycosides and saponins in various plant extracts (Mojab *et al.,* 2003; Parekh and Chanda, 2008). *Delonix elata* Linn. is a medicinal plant belong to the family of Fabaceae, (Ghada and El-Hegazi, 2011), its common name is white gulmohar, the tamil name is vaadhanaaraayanana (Samvatsar and Diwanji, 1999). It is a small deciduous tree with about 2.5-15 m in height. This plant is used for the treatment of rheumatism, abdominal pains, anti-inflammatory and flatulence. The bark of this plant is considered as an antiperiodic and anti-inflammatory agent (Ghada and El-Hegazi, 2011). Ancient Indians have been using *Delonix elata*to to cure many ailments. The leaves are used for the treatment of mammary tumor, abscesses, pneumonia and infantile diarrhea (Khare, 2007). Keeping the above points in mind this small piece of investigation focuses on the preliminary screening of the phytoconstituents present in the leaf extracts of *D. elata*.

Materials and methods

Collection of plant material: Healthy plants of *Delonix elata* were collected from different regions of Chennai, Tamil Nadu (Fig. 1). The collected plants were brought to the laboratory, shade-dried and maintained at Queen Mary's College, Chennai.

Preparation of leaf extracts: Preparation of the extracts was done according to Janarthanam *et al.* (2010).

Fig. 1. *Delonix elata* Linn.

About 1 g of dried powder of *Delonix elata* leaf was extracted with 20 mL ethanol, acetone, chloroform, aqueous and petroleum ether for 1 min using an Ultra Turax mixer (13,000 rpm) and soaked overnight at room temperature. The sample was then filtered through Whatman No. 1 paper in a Buchner funnel. The filtered solution was evaporated under vacuum in a rotary-evaporator at 40°C to a constant weight and then dissolved in respective solvents. The dissolving rate of the crude extracts was approx. 100%. The solution was stored at 18°C until use.

Phytochemical screening: Phytochemical screening of *Delonix elata* leaf extracts were assessed by standard method as described by Savithramma *et al.* (2011) and Selvaraj *et al.* (2014).

Table 1. Phytochemical screening of *Delonix elata* leaf extracts.

Phytochemicals tested	Aqueous	Ethanol	Chloroform	Petroleum ether	Acetone
Tannins	+	+	+	+	-
Saponins	+	+	+	-	-
Quinones	+	+	+	+	+
Terpenoids	+	+	-	-	+
Steroids	+	+	-	-	+
Flavonoids	+	+	+	+	+
Phenols	+	+	+	+	+
Alkaloids	+	+	-	+	-
Glycosides	-	-	-	-	-
Cardiac glycosides	+	+	+	-	-
Coumarins	+	+	+	+	+
Anthocyanin	-	-	-	-	-
Betacyanin	+	+	+	-	+

+' – Present; '–'- Absent.

Test for Tannins: One mL of the leaf extract was added to 1 mL of 5% ferric chloride. Formation of dark blue or greenish black indicates the presence of tannins.

Test for Saponins: One mL of the leaf extract was added to 1 mL of distilled water and shaken in graduated cylinder for 15 min; lengthwise formation of 1 cm layer of foam indicates the presence of saponins

Test for Quinones: One mL of the leaf extract was added to 1 mL concentrated sulphuric acid. Formation of red color indicates the presence of quinones.

Test for Flavonoids: One mL of the leaf extract was added to 1 mL 2N sodium hydroxide. Formation of yellow color indicates the presence of flavonoids.

Test for Alkaloids: One mL of the leaf extract was added to 2 mL of concentrated hydrochloric acid. Then few drops of Mayer's reagent was added**.**

Presence of green color or white precipitate indicates the presence of alkaloids.

Test for Glycosides: One mL of the leaf extract was added to 3 mL chloroform and 10% ammonium solution. Formation of pink color indicates the presence of glycosides.

Test for Cardiac Glycosides: One mL of the leaf extract was added to 2 mL glacial acetic acid and few drops of 5% $FeCl_3$. This was under layered with 1 mL of concentrated sulphuric acid. Formation of brown ring at interface indicates the presence of cardiac glycosides.

Test for Terpenoids: One mL of the leaf extract was added to 2 mL chloroform along with concentrated sulphuric acid. Formation of red brown color at the interface indicates the presence of terpenoids.

Test for Phenols: One mL of the leaf extract was added to 2 mL distilled water followed by few drops of 10% $FeCl_3$. Formation of blue/green color indicates the presence of phenols.

Test for Steroids: One mL of the leaf extract was added to 2 mL chloroform and 1 mL sulphuric acid. Formation of reddish brown ring at interface indicates the presence of steroids.

Test for Coumarins: One mL of the leaf extract was added to 1 mL 10% NaOH. Formation of yellow color indicates the presence of coumarins.

Test for Anthocyanin and Betacyanin: One mL of the leaf extract was added to 1 mL of 2N sodium hydroxide and heated for 5 min at 100°C. Formation of bluish green color indicates the presence of anthocyanin and formation of yellow color indicates the presence of betacyanin.

Results and discussion

The phytochemical constituent of *Delonix elata* leaf extracts is shown in Table 1. Phytochemical screening detected the presence of active ingredients such as tannins, saponins, quinones, terpenoids, steroids, flavonoids, phenols, alkaloids, cardiac glycosides, coumarins and betacyanin in the leaf extracts. Among the 13 phytochemical constituents tested, the ethanolic extract showed positive to all secondary metabolites except glycosides and anthocyanin, whereas, other solvents showed more activity in the order of aqueous, petroleum ether, chloroform and acetone. Our findings falls in line with Babu *et al*. (2015) who revealed the presence of significant secondary metabolites such as tannins, flavonoids, phenols, steroids, coumarins quinones, betacyanin, saponins, cardiac glycosides, alkaloids and terpenoids in *Delonix elata* leaf extracts.

Conclusion

This little piece of investigation showed interesting preliminary phytochemical constituents in aqueous and solvent leaf extracts of *Delonix elata.* Further studies should be carried out to isolate the active ingredients present in the leaf extracts which may possess potential pharmacological activities.

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