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A COMPARISON OF PHYTOCHEMICAL EVALUATION OF DENDROPHTHOE FALCATA (L.F) ETTINGSH (LORANTHACEAE) GROWING ON THE HOST PLANT AZADIRACHTA INDICA AND NERIUM OLEANDER

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Abstract:

The purpose of this study is to compare the phytochemical evaluation of Dendropthoe falcata (l.f) ettingsh (Loranthaceae) grown on Azardirachta indica and Nerium oleander as host plants. In the Azadirachta indica, the preliminary phytochemical test revealed the presence of alkaloids, reducing sugar, glycosides, flavonoids, tannins and saponins, while in the Nerium oleander, the preliminary phytochemical test revealed the presence of alkaloids, reducing sugar, glycosides, flavonids, tannis, saponin, phlobatannins and phytosterol. The preliminary phytochemical screening of the two host plant, the study revealed that Nerium oleander having better quality phytoconstituents than Azadirchta indica and this attributes to its traditional medicinal use.

Keywords: *Dendropthoe falcata, Azardirachta indica, Nerium oleander, alkaloids, flavonoids, saponins, phlobatannins.*

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INTRODUCTION:

Dendrophthoe is a genus of evergreen, shrubby, partially parasitic plants found in tropical and subtropical areas of the world. The entire parasite plant is used in traditional medicine as a cooling, bitter tonic, astringent, aphrodisiac, narcotic, diuretic, and treatment for pulmonary TB, asthma, menstrual disorders, swelling wounds, ulcers, renal and vesicle calculi, and kapha and pitta imbalances. *Dendrophthoe falcata*, a member of the Loranthaceae family, is an angiospermic hemiparasitic plant that can be found on a variety of host plants. It has 20 species, with roughly 7 of them identified in India. Traditional medicine has used *Dendrophthoe falcata*. Despite the fact that this plant is said to have a variety of medical purposes. Phytochemical and antimicrobial evaluation of a hemiparasitic mistletoe plant, Dendrophthoe falcata (L.F.) Ettingsh, parasitize on Artocarpus heterophyllus host tree. (Priya US et al., 2016). Pharmacognostical Standardization, Antimicrobial and Phytochemical Studies of *Dendrophthoe falcata* (L.F) Ettingsh (Loranthaceae) growing on the host plant *Azadirachta Indica*. (Mealiaceae). (N. Nagarajan et al., 2018). An overview of Qualitative test for preliminary phytochemical screening (Junaid R). Hence the present investigation from comparison of phytochemical studies of *Dendrophthoe Falcata* (L.F.) Ettingish growing host plant of *Azadirachta indica* and *Nerium oleander*.

MATERIALS AND METHODS:

Plant materials:

The Dendrophthoe falcata whole plant was collected from the host *Azadirachta Indica* and *Nerium oleander* during August of 2021 from Karimangalam Village, Dharmapuri District, Tamil Nadu, India and were authenticated by Dr.K.Gowrisankar, Head And Assistant Professor, PG and Research, Department of Botany, Sri Vijay Vidyalya College Of Arts And Science, Nallampalli, Dharmapuri, Tamil Nadu-636807. One set of the plant has been preserved in our laboratory for future reference.

Extraction procedure:

Whole plant of D.falcata were washed to remove the dust and dried under shade for about 2 weeks at room temperature ($30\pm2^{o}c$). The dried plant materials were grinded to coarse powder separately by mechanical device, stored and used in this work throughout the study period. Weight 100gm were then packed in the Soxhlet apparatus and extracted with ethanol. After the extraction is complete, the extracted powders were discarded and the ethanolic extracts so obtained were further preserved testing.

Preliminary Phytochemical screening:

Phytochemical evaluation is used to determine the nature of phytoconstituents present in the plant. Therefore, a complete investigation is required to characterize the phytoconstituents qualitatively. The chemical tests for various phytoconstituents in the extracts of whole plant of *Dendrophthoe falcata* were carried out as described below.

Alkaloids:

Dragendroffs Krauts test

Few ml filtrate sample, 1-2ml Dragendroff/ krauts reagents, formation of a reddish-brown precipitate indicates the presence of alkaloids.

Wagners test

Few ml filtrate sample, 1-2 drops of Wagner's reagents (along the slides of test tube), formation of a reddish-brown precipitate indicate the presence of alkaloids.

Mayers test

Few ml filtrate sample, 1-2 drops of Mayer's reagents (along the slides of test tube), formation of a creamy white precipitate indicate the presence of alkaloids.

Carbohydrates:

Molischs test:

In a test tube containing sample, 2 ml of distilled water and 2 drops of freshly prepared 20% alcoholic solution of alpha naphthol were added and mixed well. 2ml of concentrated sulphuric acid along the side of the test tube was added. Formation of violet ring at the junction of two layers, which disappears on addition of excess alkali solution, indicates the presence of carbohydrates.

Resorcinol test:

2ml extract solution with few crystals of resorcinol and equal volume of conc.HCL and heated to formation of a rose colour, indicate the presence of carbohydrates.

Reducing sugars:

Fehling's test:

The test solution was mixed with Fehling's A and B, heated and examined for the appearance of red coloration for the presence of sugar.

Glycosides:
Borntragers test:
2ml filtrate hydrolysate with 3ml chloroform and shaken well and seperated the chloroform layer and add 10% ammonia solution, formation of a pink coloured solution that indicate the presence of glycosides.

Aqueous NaoH test:
Alcoholic extract and dissolved in 1ml of water, few drops of aqueous NaoH solution, formation of a yellow colour that indicate the presence of glycosides.

Cardiac glycosides:
Keller killani test:
1ml filtrates with 1.5ml glacial acetic acid and 1 drop of 5%ferric chloride, con.H2SO4 (along with the test tube). The formation of a blue coloured solution that indicate the presence of cardiac glycosides.

Test of cardenolides:
Extract with pyridine and sodium nitroprusside with 20% NaoH, the formation of a red colour, fades to brownish yellow that indicate the presence of cardiac glycosides.

Bromine water test:
Plant extract with few ml of bromine water, formation of yellow precipitate that indicates the presence of cardiac glycosides.

Proteins and aminoacid:
Biuret test:
2ml filtrate with 1 drops of 2% copper sulphate solution and 1ml of 95% ethanol, KOH pellets. The formation of a pink coloured solution that indicate the presence of proteins.

Ninhydrin test:
2ml filtrate with 2drops of Ninhydrin solution .The formation of purple coloured solution that indicate the presence of aminoacid.

Flavonoids:
Alkaline reagent test:
1ml extract with 2ml of 2%NaoH solution and few drops dil.Hcl, formation of an intense yellow coloured, becomes colourless on addition of diluted acid that indicate the presence of flavonoids.

Lead acetate test:
1ml plant extract with few drops of 10% lead acetate solution. The formation of a yellow precipitate that indicate the presence of flavonoids.

Ferric chloride test:
Extract aqueous solution with few drops 10% ferric chloride solution. The formation of a green colour that indicate the presence of flavonoids.

Ammonia test:
Filtrate with 5ml dil.ammonia solution and conc. H_2SO_4. The formation of a yellow colour that indicate the presence of flavonoids.

Conc. H_2SO_4 test:
Plant extract and conc. H_2SO_4. The formation of an orange colour that indicate the presence of flavonoids.

Phenol:
Iodine test:
1ml extract with few drops of dil. Iodine solution. The formation of a transient red colour that indicate the presence of Phenol.

Tannins:
Gelatin test:
Plant extract is dissolved in 5ml distilled water with 1% gelatin solution and 10% NaCl. The formation of a white precipitate that indicate the presence of tannins.

Phlobatannins:
HCl test:
2ml aqueous extract with 2ml 1% HCl and boiled.The formation of a red precipitate that indicate the presence of phlobatannins.

Saponins:
Foam test:
0.5gm plant extract with 2ml water and vigorously shaken. Formation of persistent foam for 10 min that indicate the presence of saponins.

$NaHCO_3$ test:
Plant extract with few ml sodium bicarbonate solution and distilled water then vigorously shaken. Formation of stable honey comb like froth that indicate the presence of saponins.

Haemolysis test:
Drop of fresh blood on glass slide with plant extract, formation of zone hemolysis that indicate the presence of saponins.

Phytosterols:
Salkowski's test:

Filtrate with few drops of conc. H_2SO_4 and shaken well and allowed to stand. Formation of red colour in lower layer that indicate the presence of phytosterols.

Hesse's response:
5ml aqueous extract with 2ml chloroform and 2ml conc. H_2SO_4. Formation of red colour in lower chloroform layer that indicate the presence of phytosterols.

Cholesterol:
2ml extract with 2ml chloroform and 10 drops of acteic anhydride. Add 2-3 drops of conc. H2so4. Formation of a red rose colour that indicates the presence of cholesterol.

Terpinoides:
2ml chloroform with 5ml plant extract (evaporated on water bath) and 3ml on h2so4 with boiled on water bath. Formation of a grey coloured solution that indicate the presence of terpinoides.

Diterpenes:
Copper acetate test:
Plant extract is dissolved in distilled water with 3-4 drops of copper acetate solution. Formation of emerald green colour that indicate the presence of diterpenes.

Coumarins:
NaOH test:
Plant extracts with 10% NaOH and adds to chloroform. Formation of a yellow colour that indicate the presence of coumarins.

Resins:
Turbidity test:
10ml extract with 20ml 4% HCl to formation of turbidity that indicate the presence of resin.

Carboxylic acid:
Effervescence test:
1ml plant extract with 1ml sodium bicarbonate solution. Formation of appearance of effervescence that indicate the presence of Carboxylic acid**.**

RESULTS AND DISCUSSION:

The results of phytochemical studies are as follows,

Extraction:
The whole plant was extracted using ethanol in Soxhlet apparatus. The semisolid extract, so obtained were greenish black in colour the extractive value is 7.3 (Azadirachta indica) and 6.5 (Nerium oleander). Table no:1

Table 1:Percentage yield of successive extracts of whole plant of dendrophthoe falcata

S.no	Extract	Host plant	Method of extraction	Physical nature	Colour	Percentage Yield (%w/w)
1.	Ethanol	Azadirachta indica	Continuous extraction using Soxhlet apparatus	Semi solid	Greenish black	7.3
2.		Nerium oleander		Semi solid	Greenish black	6.5

Preliminary phytochemical screening:
The ethanolic extracts of Dendrophthoe falcata are tested find the presence of different class's compounds. Various qualitative chemical tests for the preliminary phytochemical screening of the extract of ethanol were applied. The phytochemical test on extract of the Azadirachta indica revealed the presence of alkaloids, glycosides, flavonoids, tannis and saponin, while in the Nerium oleander revealed the presence of alkaloids, glycosides flavonids, tannis, saponin, phlobatannins and phytosterols. Table no: 2

Note: + ve indicates positive result,
- ve indicates negative result
EE - Ethanol Extract
DFEE 1 - Dendrophthoe falcate from Azadirachta indica
DFEE 2 - Dendrophthoe falcate from Nerium oleander

Table 2: Qualitative Preliminary phytochemical screening of Dendrophthoe falcata (l.f) ettingsh whole plant growing on the host plant Azadirachta indica and Nerium oleander

S.NO	TEST	DFEE 1	DFEE 2
1.	Alkaloids	+	+
2.	Carbohydrates	-	-
3.	Reducing sugar	+	+
4.	Glycosides	+	+
5.	Cardiac glycosides	+	+
6.	Protein and aminoacid	-	-
7.	Flavonoids	+	+
8.	Phenol	-	-
9.	Tannis	+	+
10.	Phlobatannins	+	+
11.	Saponins	+	+
12.	Phytosterols	-	+
13.	Cholesterol	+	+
14.	Terpenoides	-	-
15.	Diterpenes	+	+
16.	Coumarins	+	+
17.	Resins	+	+
18.	Carboxylic acid	-	+

CONCLUSION:

It is concluded that the Dendrophthoe falcata (l.f) ettingsh whole plant is extracted is check the preliminary phytochemical screening of the two host plant; the study revealed that Nerium oleander having better quality phytoconstituents than Azadirchta indica and this attributes to its traditional medicinal use.

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