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# Phytochemical screening of *Mirabilus jalap* Linn leaf extract by TLC

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**ABSTRACT**

*Mirabilus jalap* Linn (Nyctaginaceae) known as four O'Clock is an important medicinal plant used in our Traditional Systems of Medicine for treating various diseases like diuretic, purgative, wound healing and as aphrodisiac. Identification of primary and secondary constituents has become the utmost important tool for the presence of active moiety. The phytochemical screening of petroleum ether, chloroform, methanol and water extracts of *Mirabilus jalap* leaf was done by Thin Layer Chromatography. Petroleum ether extract showed the presence of fatty acids, chloroform extracts showed the presence of triterpens and sterols. Flavonoids, carbohydrates, amino acids and saponins were present in methanoicl extract whereas saponins, phenolic substances and tannins were present in the water extract of *Mirabilus jalap.*

**Key words:** *Mirabilus jalap*, Phytochemical screening, Extracts, Thin Layer Chromatograpy

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## INTRODUCTION

*Mirabilus jalap* Linn (Nyctaginaceae) known as four O'Clock is an important medicinal plant used in our Traditional Systems of Medicine for treating various diseases like diuretic, purgative, wound healing and as aphrodisiac [1]. The flowers are reported to be used as food colouriant. Flowers are used in cakes and jellies as colourant due to crimson dye. The root is used as an aphrodisiac as well as diuretic and purgative. It is also used in the treatment of dropsy. The leaves are used to reduce inflammation [2]. Decoctions of leaves are used in the treatment of abscesses and also used in treating wounds. The seeds are considered poisonous. The plant is leafy, shrubed with multi-branched perennials which produce flowers throughout the summer season. The plants are erect and spread up to 2-3 ft (0.6-0.9 m) tall. Branches are numerous and arranged oppositely with pointed 2-4 leaves in them which bear a size from 5-10 cm long. The flowers are seen in clusters, with a wide variety of colours red, magenta, pink, yellow or white. The flowers are of trumpet shaped. The presence of oxymethyl anthraquinone, trigonelline, arabinose galactose, beta-sitosterol in leaves has been reported [3, 4, 5]. Hence the present work was undertaken to explore the constituents in various extract so that it can be used for the betterment of mankind.

## MATERIALS AND METHODS

### Plant Material

Fresh leaves of the plant *Mirabilus jalap* (Linn.) were obtained identified and authenticated from standard resources .The collected leaves were dried in shade, crushed to coarse powder and used for further studies.

### Preparation of Extract

The leaves of *Mirabilus jalap* were collected, dried in the shade, powdered, weighed (1 kg) and they were subjected to continuous hot extraction in soxhlet apparatus. The extraction was carried out as per the polarity of the solvents with petroleum ether chloroform, methanol and finally with water for 36 hours. The solebt from each extraction was distilled off and the concentration was carried out on a water bat to appropriate consistency and then evaporated to dryness and used for the phytochemical analysis. The residue for each extract was petroleum ether (120 gm), chloroform (200 gm), methanol (300 gm) and finally water (100 gm) [6]. The extracts were subjected to preliminary qualitative tests to identify the various phytoconstituents present in leaves [7].

**Amino acids**: The amino acids can be detected as per the standard procedure depicted in Harbone, 1973. The plant material was mixed with 10 % isopropanol and ground using motor and pestle. The filtrate was centrifuged at 13000 rpm for 3 min and the supoernatent was used for the detection of amino acid. Samples were spotted on TLC plate using n-butanol-acetic acid-

water (12:3:5) as mobile phase. TLC plates were sprayed with 0.2% Ninhydrin in acetone, dried over at 105°C for 1-2 minutes. The presence of violet colour to pink colour indicates.
**Essential oils**: They were detected by using methelyne-di-chloride-chloroform –ethyl acetate-n-propanaol (47: 45: 2: 2.5) as mobile phase. TLC plates were sprayed with vanillin sulphuric acid reagent dried at 105°Cfor 2 minutes. Appearance of pink, brown colour spots shows the presence of essential oils [8].

**Triterpenoids**: The detection for triterpenoids was done by applying the ssamples on TLC plate impregnated with silver nitrate and they were developed in butanol-2M ammonium hydroxide (1:1) as mobile phase. The detection was done by spraying antimony trichloride. The purplish spot indicates the presence of triterpenoids.

**Alkaloids**: They can be detected by Dragendroff's reagent. The test sample was applied on precoated TLC plates developed in chloroform: Methanol (9:1) as mobile phase, dried sprayed with the reagent. Appearance of orange red spot at room temperature indicates the presence of alkaloid.

**Saponin**: Sample was applied on TLC plates developed in Chlorofrom-methanol-water (60:35:5) as mobile phase and dried. Plates were then sprayed with 1% vanillin 5% sulphuric acid reagent and dried at 110°C for few minutes glycosides appear as dark bluish to black spot.

**Sterols:** Generally steroids have a nucleus of cyclopentene perhydrophananthrene found in plant tissues called as phytosterols. In higher plants stigmasterol, sitosterol are the most common sterols found in abundant which are in free and in combined form Harbone [7]. For the detection of steroids samples were applied on TLC plates developed in Chloroform-methanol (3:4) as mobile phase and were deteced by spraying anisaldehyde. TLC plates were also developed in benzene- methanol (95:5) as another mobile phase and were detected by spraying 5% alcoholic sulphuric acid reagent. Bluish- green spots were observed [9].

**Fatty acids**: For the detection of fatty acids samples were applied on a pre coated TLC plates, aur dried and were developed in Hexane- ethyl acetate (95: 5) as mobile phase, sprayed with 5% alcoholic potassium permanganate solution. The appearance of dark brown spots indicates the presence of fatty acids.

## RESULT AND DISCUSSION

The results of preliminary phytochemical screening of petroleum ether, chloroform, methanol and water extracts of *Mirabilus jalap* leaves (Table 1) revealed that Petroleum ether extract showed the presence of fatty acids, chloroform extracts showed the presence of triterpens and sterols. Flavonoids, carbohydrates, amino acids and saponins were present in methanol extract and saponins, phenolic substances and tannins were present in the water extract of *Mirabilus jalap.*

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## CONCLUSION

Thus from the above investigation it can be concluded that these primary and secondary metabolites obtained from the extracts can be further taken up as individual extract and active or marker compounda can be isolated for the desired therapeutic effect.

**TABLE 1: PRELIMINARY PHYTOCHEMICAL SCREENING OF *MIRABILUS JALAP* LEAF EXTRACT.**

| S.No | Test | PE | CE | ME | WE |
|---|---|---|---|---|---|
| 1 | Amino Acid | - | - | + | - |
| 2 | Triterpenoids | - | + | - | - |
| 3 | Flavonoids | - | - | + | - |
| 4 | Saponins | - | - | - | + |
| 5 | Sterols | + | + | - | - |
| 6 | Fatty acids | + | - | - | - |
| 7 | Phenols | - | - | - | + |
| 8 | Tannins | - | - | - | + |
| 9 | Carbohydrates | - | - | + | - |

PE-Petroleum ether extract, CE-Chloroform extract, ME-Methaloic Extract, WE-Water extract

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