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Phytochemical analysis of some medicinal plants

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Abstract

The extract of leaves of *Murraya koenigii*, *Punica granatum*, *Jatropha curcas*, *Lawsonia inermis*, *Capsicum annum*, *Syzygium cumini* were investigated for its phytochemical analysis. Qualitative phytochemical analysis of these plants confirm the various secondary metabolites like saponins, terpenoids, steroids, anthocyanins, tannis, flavonoids and alkaloids (Table no.1). Therefore these secondary metabolites had played fundamental role in controlling the vegetable diseases due to their antioxidant activities. This study provides the information for preventing the plant diseases at affordable cost and eco-friendly.

Keywords: Leaf extract, secondary metabolites, medicinal plants, screening, tannins, steroids

1. Introduction

Since ancient time's people have exploring the nature particularly plants in search of new drugs. This has resulted in the case of large number of medicinal plants with curative properties to treat various diseases to treat various disease [verpoorte, R. *et al.* 1998] ^[10]. The study of plants continues principally for the discovery of novel study secondary metabolites. Secondary metabolites are the natural products that have an ecological role in regulating the interaction between plants and their environment. Plants are rich source of secondary metabolites with interesting biological activities. The importance of plant secondary metabolites in medicine, agriculture and industry has led to numerous studies on the synthesis, biosynthesis and biological activity of these substances and much effective against various fungal and bacterial pathogens.

Murraya koenigii is medicinal plant that has been widely used India as Ayurvedic herbal medicine and its leaves shows highest antibacterial activity against *Shigella sonnei* and *salmonella typhi*. *Punica granatum* leaf extract caused a significant difference between inhibitory effects on growth on *Botrytis fabae* (Ayman Y. *et al.*, 2013) ^[4]. *Jatropha curcas*, *Lawsonia inermis*, and *Capsicum annum* also having antimicrobial activity against Fungi and Bacteria.

In the present work, qualitative phytochemical analysis was carried out in 6 plants.

2-Material and Methods**(i) Collection and identification**

Fresh leaves of different plants species free from diseased were collected during the month of FEB 2016 from different locations of Aurangabad District. Leaves were collected from *Murraya koenigii*, *Punica granatum*, *Jatropha curcas*, *Lawsonia inermis*, *Capsicum annum* and *Syzygium cumini* 6 medicinal plants (Figure No.1-6).

Medicinal plants	Common name	Family
1) <i>Murraya koenigii</i>	(Kadipatta)	Rutaceae
2) <i>Punica granatum</i> .	(Pomegranate)	Lythraceae
3) <i>Jatropha curcas</i>	(Arandi)	Euphorbiaceae
4) <i>Lawsonia inermis</i> .	(Mehendi)	Lythraceae
5) <i>Capsicum annum</i>	(Bell pepper)	Solanaceae
6) <i>Syzygium cumini</i>	(Jamun)	Myrtaceae

(ii) Extraction of Leaves

The collected leaves were surface sterilized by 0.1% mercuric chloride. Then leaves were washed thoroughly 2-3 times with Distilled water, leaf material was then air dried under shade.

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After complete shade drying the plant material was grinded and powder was kept in small plastic jars with labelling. The grinded leaves material of 10gm weighed using an electronic balance and mixed with 100ml solvent (80% methanol) in 250ml flask and kept on shaker for 24 hrs. Then it was allowed to stand for 30 min to stand the plant material and it was filtered through Whatman’s No.1 filter paper and centrifuged at 2500 rpm for 15 min (Fig no.7). And filtrate was stored in sterile bottles at 5°c for further use.

(iii) Phytochemical screening

Preliminary qualitative phytochemical screening was carried out with the following tests method. [Raman and Wagner].

[a] Sterioids-1ml of extract was dissolved in 10 ml of chloroform and equal volume of concentrated sulphuric acid was added by sides of test tube .The upper layer turns red and red and sulphuric layer showed yellow with green fluorescence . This indicated the presence of steroids.

[b] Terpenoids-2 ml of extract was added to 2ml of acetic anhydride and conc. H₂SO₄. Formation of blue green rings indicates the presence of terpenoids.

[c] Flavonoids-To 1 ml of extract, 1 ml of extract, 1 ml of 10 % lead acetate solution was added. The formation of a yellow precipitate was taken as a positive test for flavonoids.

[d] Tannins – 2 ml of extract was added to few drops of 1% lead acetate. A yellow precipitate indicated the presence of Tannins.

[e] Saponins – 5 ml of extract was mixed with 20 ml of distilled water and then agitated in a graduated cylinder for 15 minutes. Formation of foam indicates the presence of saponins.

[f] Anthocyanins- 2 ml of aqueous extract is added to 2 ml of 2N HCL and ammonia. The appearance of pink-red turns blue-violet indicates the presence of anthocyanins.

[g] Alkaloids- 3 ml extract stirred with 3 ml of 1% HCL on steam bath. Mayer and Wagner’s reagent was then added to mixture. Turbidity of the resulting precipitate was taken as an evidence for the presence of alkaloids.

Table 1: Screening of medicinal plants for secondary metabolites

Sr. No.	Medicinal plant	Steroids	Terpenoids	Flavonoids	Tannins	saponins	Anthocyanins	alkaloids
1	<i>Murraya koenigii</i>	+	+	+	+	+	+	+
2	<i>Punica granatum</i>	–	+	+	+	–	+	+
3	<i>Jatropa curcas</i>	+	+	+	–	+	–	+
4	<i>Lawsonia inermis</i>	–	+	–	+	+	–	+
5	<i>Capsicum annum</i>	+	–	+	+	–	–	+
6	<i>Syzygium cumini</i>	–	+	+	+	–	–	+

Note: ‘+’ present and ‘–’ absent.



Fig 1: 1) *Murraya koenigii* 2) *Punica granatum* 3) *Jatropa curcas*



Fig 4: 4) *Lawsonia inermis* 5) *Capsicum annum* 6) *Syzygium cumini*



Fig 7: Medicinal plants and their extracts

3. Results and Discussion

Qualitative phytochemical screening was done from leaf extract of *murraya koenigii*, *punica granatum*, *jatropha curcas*, *lawsonia inermis* *capsicum annum*, *syzygium cumini* of 6 medicinal plants studied. It showed that the leaves were rich in steroids terpenoids, flavonoids, tannins, saponins, arthocyanins and alkaloids (Table no.1)

Anthocyanins were present in *Murraya koenigii* and *punica granatum* that helps in controlling the viral infections of vegetable plants. The recorded results showed that *Murraya koenigii* was potential antioxidant. The leaf extract detected the phytochemicals including Flavonoids, Steroids, Terpenoids, Tannins, Saponins, Anthocyanins and Alkaloids. These results are been supported by Ali Ghasemzadeh *et al.* 2014.

Leaves extract of *punica granatum* showed the presence of phytochemical constituents such as terpenoids, flavonoids, Tannins, anthocyanins and alkaloids. Therefore Steroids and saponins are absent. [A.R. Florence and *et al.* (2015)]^[3] Also supported to this result.

The crude extract of *jatropha curcas* showed the presence of phytochemical constituents such as *steroids*, Terpenoids, flavonoids, Saponins and Alkaloids. Therefore anthocyanins and tannins were absent. These results were also supported by [Ahirrao R.A. *et al.* (2011)]^[1].

Leaves extract of *lawsonia inermis* showed the presence of phytochemical constituents terpenoids, Tannins, saponins and alkaloids. These results supported by [A.R. Florence and *et.al* (2015)]^[3]. *Capsicum annum* leaves extract detected phytochemical constituents which are steroids, flavonoids, *tannins and alkaloids*. Whereas Terpenoids, saponins and Anthocyanins were absent. These results were supported by [Aziagaba B.O, and *et al.* (2013)]^[5].

Syzygium cumini leaves extract showed the presence of phytochemical constituents Terpenoids, flavonoids, tannins and Alkaloids. Whereas steroids, saponins and anthocyanins were absent. These results were also supported by [Muniappan Ayyanar *et al.* (2012)]^[6].

4. Conclusion

The phytochemical study revealed the presence of steroids, Terpenoids, flavonoids, Saponins, tannins, saponins, arthocyanins and alkaloids. The phytochemical tests are helpful in finding various secondary metabolites which are responsible in controlling the fungal pathogens of vegetable crops.

Therefore these medicinal plants are playing the fundamental role in disease control at the cost of pesticides

which are acting as biological controlling agents helping the vegetable growers to get rid from synthetic drugs.

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