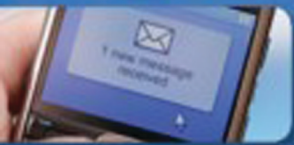


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Preliminary Phytochemical Studies on *Withania Somnifera*, *Datura Stramonium* and *Solanum Surattenses* from District of Raigad Maharashtra State (India)

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Abstract

Secondary metabolites are the chemical constituents present in the plants and are important in determining medicinal properties of the plant. The present paper deals with the phytochemical screening of *Withania somnifera*, *Datura stramonium* and *Solanum surattenses* an important medicinal plants. This study involves preliminary qualitative estimation of secondary metabolites from root stem and leaves. This work was carried out to evaluate the variation of secondary metabolites in different plant part in rainy season. All the mentioned plant belonging to family solanaceae. The samples were collected at the end of rainy season in the month of September. The finding shows that alkaloids are present in trace amount in different plant part while the flavonoids are almost absent in the rainy season.

Key Words: *Withania somnifera*, *Datura stramonium*, *Solanum surattenses*

Introduction

Medicinal plants have a considerable importance as a source of pharmaceutically active substances. Plants used by peoples for the cure of a number of diseases ethnobotany is considered to be part of economic botany, which emphasizes the economic utilization of plants for human welfare. Medicinal plants are of great importance to the health of individuals and communities. The medicinal values of these plants lie in some chemical substances that produce a definite physiological action on the human body most important of these bioactive constituents of plants are alkaloids, tannins, flavonoids and phenolic compounds (Hill 1952) The global herbal drug market is growing. It is no wonder, during the past decade there has been an exponential rise in the application of herbal remedies.

Different medicinal plant species show a marked variation in active ingredient during different seasons these have been widely attributed to variation in environmental variables such as temperature & rainfall (Reddy & Reddy, 1997 Ghimire et al, 2006 Kumar et al: 2007 Ahmad et al 2008: 2009) In addition there is no knowledge in local harvester for choosing an appropriate time for harvesting to maximize the medicinal potency of plants such *Withania somnifera*, *Datura stramonium*, *Solanum surattenses*. The major objective of this study was to evaluate these species for variation in medicinal ingredients of plants growing under natural conditions during different seasons. In addition this study also aimed to identify suitable harvesting times for the harvest of optimal levels of medicinal components from the above plant. Environmental conditions affect the plant growth as well as the formation of

secondary metabolites, as they are mostly formed in young and actively growing tissues. Thus the seasonal changes have effect on the physiological parameter. For this study three medicinal plants such as *Withania somnifera*, *Datura stramonium* and *Solanum surattenses* were selected. The aim of the present study was to investigate the presence of phytochemicals of selected medicinal plants. Fresh parts of medicinal plants were collected from different places of Raigad district of Maharashtra state.

Materials & Methods: The whole plant parts in this investigation were collected from Raigad district of Maharashtra state during the rainy season. Fresh plant parts free from diseases were collected during the month of Sept. 2013 and voucher specimen of the plant were preserved. Taxonomic identification of the plants was carried out with the help of Botanical Survey of India (BSI) Western region Pune. Fresh plant material were washed under running tap water then air dried under shade after complete shade drying the plant material was grinded in mixer, the powder was kept in small plastic bags with paper labelling. The grinded material of 5 gm weighed using an electronic balance and was crushed in 25 ml of sterile water boiled at 50-60 °C for 30 minutes on was filtered through Whatman No. 1 filter paper then filtrate was centrifuged at 2500 rpm for 15 minutes and filtrate was stored in sterile bottle for further use.

Phytochemical Screening:

Preliminary qualitative phytochemical screening was carried out with the help of following methods.

1. Steroids: 1 ml of the extract was dissolved in 10 ml of chloroform and equal

volume of concentrated sulphuric acid was added by side of test tube. The upper layer turns red and sulphuric acid layer show yellow with green fluorescence. This indicated the presence of steroids.

2. Terpenoids: 2 ml of extract was added to 2 ml of acetic anhydride and concentration of H₂SO₄ formation of blue green rings indicate the presence of terpenoids.

3. Tannins: 2 ml of extract was added to few drops of 1% lead acetate. A yellowish precipitate indicates the presence of tannins.

4. 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 indicate the presence of saponine.

5. Alkaloids: a) Mayers Test : A fraction of extract was treated with Mayers test reagent (1.36 gm of mercuric chloride & 5 gm of potassium iodide in 100 ml of water) and observed for the formation of cream coloured precipitate. b) Wagner's Test: A fraction of extract was treated with Wagner's reagent (1.27 gm of iodine and 2 gm of potassium iodide in 100 ml of water) and observed for the formation of reddish brown colour precipitate.

6. Flavonoids: NaoH Test - A small amount of extract was treated with Aqueous NaoH and HCl, observe for the formation of yellow orange colour.

H₂SO₄ Test - A fraction of extract was treated with concentrated H₂SO₄ and observed for the formation of orange colour.

7. Proteins: Millions Test - Mix 3 ml test solution with 5 ml millions reagents. White ppt forms, warm the ppt, it turns

brick red or the ppt dissolves giving red colour solution.

Biuret Test: To 3 ml test solution added 4 % NaOH and few drops of 1 % CuSO_4 solution violet or pink colour appears.

8. Glycosides: (Anthraquinone glycoside)

Borntrager Test - To 3 ml extract add dil. H_2SO_4 . Boil and filter. To cold filtrate, add equal volume of benzene or chloroform, shake well separate the organic solvent. Add ammonia ammoniacal layer turns pink or red.

Test for Saponine glycoside (Foam Test)
Shake the drug extract or dry powder vigorously with water persistent foam observed.

9. Flavonoids: Shinoda Test - To dry powder or extract add 5 ml 95 % ethanol few drops of con. HCl and 0.5 gm magnesium turnings. Pink colour observed.

10. Phenolic compounds : To 2 - 3 ml of aqueous or alcoholic extract, add few drops of 5 % FeCl_3 Solution deep blue colour appear.

Result

1. Qualitative analysis of Withania somnifera plant

Plant part	Alkaloids	Tannins	Flavonoids	Lignin	Phenolic Compounds	Glycosides	Steroids	Saponine	Terpenoids
Root	+	+	+	+	+	+	+	+	+
Stem	+	+	-	+	+	+	+	+	+
Leaves	+	+	-	+	+	+	+	+	+

(+ Indicates the presence of chemicals, - Indicates the absence of chemicals)

2. Qualitative analysis of Datura stramonium plant

Plant part	Alkaloids	Tannins	Flavonoids	Lignin	Phenolic Compounds	Glycosides	Steroids	Saponine	Terpenoids
Root	+	+	-	+	+	+	+	+	+
Stem	-	+	-	+	+	+	+	+	+
Leaves	+	+	-	+	+	+	+	+	+

(+ Indicates the presence of chemicals, - Indicates the absence of chemicals)

3. Qualitative analysis of Solanum surattenses plant

Plant part	Alkaloids	Tannins	Flavonoids	Lignin	Phenolic Compounds	Glycosides	Steroids	Saponine	Terpenoids
Root	+	+	-	+	+	+	+	+	+
Stem	+	+	-	+	+	+	+	+	+
Leaves	+	+	+	+	+	+	+	+	+

(+ Indicates the presence of chemicals, - Indicates the absence of chemicals)

Discussion: Presence of phytochemicals contribute medicinal as well as physiological properties to the plant which used in treatment of different ailments. Therefore extract from these plant could be seen as good source for different drugs. Phytochemicals analysis is very important in the evaluation of active biological components of medicinal plants. By use of the qualitative analysis one can easily know about the medicinal potency of plants. The qualitative analysis were carried out with the help of ethanolic extract of plant material (Root, Stem, Leaves). The extract of stem and root of *Withania somnifera* reveals the presence

of phenolic compounds, lignin, saponine, Glycosides while alkaloids & Tannins present in traces, flavonoids are absent. The leaves extract shows abundant tannins, lignin and trace amount of alkaloids. Same condition observed in extract of root of *Withania somnifera*. While in qualitative estimation of *Datura stramonium* Tannins, lignins, phenolic compounds, Glycosides, Saponine present in all plant parts. Alkaloid absent in stem while it is in trace amount in leaves. flavonoids are absent in all plant parts. The phytochemical screening of *Solanum surattense* shows presence of all chemicals except the flavonoids.

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