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QUALITATIVE PHYTOCHEMICAL ANALYSIS OF INDIAN MEDICINAL PLANT *WITHANIA SOMNIFERA AND RAUWOLFIA SERPENTINE* EXTRACTS

Virendra Vaishnav*[1], Debasish Sahoo[2], Tanushree Chatterjee[3], Sheetal devtare[4], Apurva Sharma[5] and Pooja Sahu

[1,2]PhD Scholar, Chhattisgarh Swami Vivekanand Technical University, Bhilai, Chhattisgarh, India.
[3,4,5,6]Department of Biotechnology, Raipur Institute of Technology, Raipur, Chhattisgarh, India.

***Corresponding Author: Virendra Vaishnav**
PhD Scholar, Chhattisgarh Swami Vivekanand Technical University, Bhilai, Chhattisgarh, India.

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ABSTRACT
Indian medicinal plant *Withania somnifera* and *Rauwolfia serpentina* were investigated for their phytochemical compounds. Stem and root extracts of *Withania somnifera* and *Rauwolfia serpentina* were prepared through Soxhlet apparatus. Acetone, Chloroform and methanol were used as solvent system for extracts. The results analyzed the presence of bioactive compounds include Alkaloids, carbohydrate, phenols, glycosides, steroids, flavonoids, and glycosides. *Rauwolfia serpentina* and *Withania somnifera* is a good source of carbohydrates, glycosides, protein, alkaloids, flavonoids, and phytosterols. Hence both plants is used for the extraction of useful natural drugs.

KEYWORDS: Soxhlet, Alkaloids, Phytochemical, *Withania somnifera, Rauwolfia serpentine.*

INTRODUCTION
Since ancient times, people have been finding new drugs from nature plant and resulted in the use of a great number of medicinal plants to treat different diseases.[16] Researcher interested in the study and utilize of traditional medicine in diverse parts of the plants. Therefore plant yield are considered to be less side-effects and less toxic than synthetic drugs.[2]

Withania somnifera also known as Indian ginseng belongs to the Solanaceae family. *Withania somnifera* is an intense pubescent shrub it grows about 2 feet in height and locally known as Ashwagandha. It is a widely use as medicinal plant for its remedial use in Ayurvedic and Unani systems of traditional medicine of India.[6,11] The roots ashwagandha are the essential part of the whole plant because of it possess broad number of therapeutic agents. The root of ashwagandha herb is termed as rasayana in Ayurvedic system, which means it used as a tonic for longevity and vitality.[12] *Withania somnifera* stimulates the cells of immnune system like phagocytes and lymphocytes, which also work against the stress effects and generally promote wellness.[17] Biological properties of plant include anti tumor, anti inflammatory, anti oxidant, anti cancer, sleep inducing, anti stress, effective in memory related condition and insomnia, hemopoetic and cardiopulmonary system.[9]

Fig.1 *Rauwolfia serpentine.*

Fig. 2 *Withania somnifera.*

R. serpentina belongs to Apocynaceae family and usually known as Snake root plant, Sarpagandha, Harkaya, Chandrabagha, Chandrika and Chotachand[3] *Rauwolfia serpentina* is a woody, evergreen, glabrous and perennial shrub with height about 60-90 cm. The plant have tuberous root along with pale brown cork as well as elliptic to lanceolate or obovate leaves in whorls of three, 10 cm long and 5 cm broad.[1] The leaves, roots and juice are of therapeutic significance properties have paying attention of researcher of indigenous system of medicine. It contain various types of secondary metabolites (N- containing indole alkaloids) mainly located in the roots and rhizomes.[4,7] In Ayurvedic medicines, *R. serpentine* root is used as a medication for curing insomnia, epilepsy, hypertension, excitement, gastrointestinal disorders, mental agitation, excitement, traumas, anxiety, schizophrenia, sedative insomnia and insanity.[5] *Rauwolfia serpentina* (Linn.) has some important chemical compounds such as alkaloids, carbon compounds, fatty oils, glycosides, essential oils, mucilage, tannins, resins and gums.[8] Mainly these are powerful bioactive compounds found in parts of medicinal plant that could be used for therapeutic reason or useful precursors for the synthesis of drugs.[13] Phytochemical investigation of this medicinal plant has been a trendy research field and some works have been reported in this area.[16]

The present study helps to evaluate the phytochemical properties of roots and stem of *Withania somnifera* and *Rauwolfia serpentine.* This could report for its different medicinal properties.

MATERIAL AND METHODS

Plant Materials and Chemicals

Root and stem of *R. serpentina* and *Withania somnifera* were purchased from ayurvedic shop of Raipur Chhattisgarh. The plant materials (stem and roots) of *R. serpentina* and *Withania somnifera* were dried in shady place and grinded to make fine powder using mortar and pestle. Chemicals and reagents were procured from himedia Hyderabad.

Fig.3 *Withania somnifera* Root.

Fig.4 *R. serpentine* Root.

Preparation of extract

Three extract of root and stem of *Withania somnifera* and *R. serpentina* were prepared using soxhlet extraction technique. About 100 grams of fine powder of stem and root of *R. serpentine and Withania somnifera* were extracted with Acetone, chloroform and Methanol (200 ml) for 24 hours in soxhlet. The collected methanol, Acetone and chloroform extracts of root and stem of *R. serpentine and Withania somnifera* were concentrated dried to solid on water bath and dissolved to their respective solvents.

Qualitative analysis of Phytochemical Constituents

The root and stem extracts of *Rauwolfia serpentine and Withania somnifera* were tested for primary screening of phytochemicals like carbohydrates, alkaloids, Tannins, carbohydrates, flavonoids, , phenols, steroids.[10,15]

Test for Alkaloids

Wagner's Test- Extracts were treated with Wagner's reagent. Formation of reddish/brown precipitate indicates the presence of alkaloids.

Test for Flavonoids

NaOH test**:** Extract was treated with aqueous NaOH and HCl, and observed for the formation of yellow orange color.

Test forTannins

Ferric chloride test: 0.5ml of extract and a few drops of 0.1% FeCl3 was added and observed for brownish green-black or a blue-black coloration.

Test for Phenols

Ferric chloride test: About 2ml extract was taken to water and warmed at 45-50^{0}C. Then 2 ml of 0.3% FeCl3 was added. Formation of green or blue color showed the presence of phenols.

Test for Glycosides

Fehling's test: 1ml of plant extract was mixed with 1ml of Fehling‟s solution and boiled in a water bath for 5 min. The formation of brick red precipitation indicates the presence of glycosides.

RESULTS AND DISCUSSIONS

Phytochemical screening of stem and root extracts of *Withania somnifera* and *R. serpentina* were presented in Table 1 and Table 2. Phenolic, Flavonoid, alkaloids compounds were observed in stem and root extracts, while phenols were not shown in chloroform and methanol root extract as well as chloroform and methanol stem extracts of *R. serpentina*. Flavonoid was shown positive in stem and leaf extracts, except methanol stem and root extract of *Withania somnifera*. Phytosterols are observed in leaf and root extracts of *R. serpentina*, while chloroform stem extract and methanol root extract of *Withania somnifera* were showed negative result phytosterols. Carbohydrate was observed in root and stems extracts. Tannins, phenolic, alkaloids, flavonoids and phytosterols were extracted in all the solvent extracts.

Table 1. Phytochemical Analysis of *Withania somnifera.*

Test	*Withania somnifera*					
	Stem			Root		
	Acetone Extract	Chloroform Extract	Methanol Extract	Acetone Extract	Chloroform Extract	Methanol Extract
Phenols	+	+	+	+	+	+
Flavonoids	+	+	-	+	+	-
Tannins	-	+	+	-	+	+
Glycosides	+	-	+	-	-	+
Alkaloids	+	+	+	+	+	+
Proteins	+	+	+	-	+	-
Carbohydrate	+	+	+	+	+	+
Caumarins	-	+	+	+	+	+
Anthroquinon	-	+	-	-	+	+
Phytosterol	+	-	+	+	+	-

Table 2. Phytochemical Analysis of *Rauwolfia serpentina.*

Test	*Rauwolfia serpentina*					
	Stem			Root		
	Acetone Extract	Chloroform Extract	Methanol Extract	Acetone Extract	Chloroform Extract	Methanol Extract
Phenols	+	-	-	+	-	-
Flavonoids	+	+	+	+	+	+
Tannins	+	-	-	+	-	-
Glycosides	+	-	-	+	+	-
Alkaloids	+	+	-	+	+	-
Proteins	+	-	+	+	-	+
Carbohydrate	+	+	+	+	+	+
Caumarins	-	-	-	+	-	-
Anthroquinon	+	+	+	-	-	-
Phytosterol	+	+	+	+	-	+

CONCLUSION

The studies for *Withania somnifera* and *Rauwolfia serpentina* could be excellent natural source of chemotherapeutic agent. *Withania somnifera* and *Rauwolfia serpentina* are a plant used in Ayurvedic medicine since long time in India. *Withania somnifera* has been using as an anti-inflammatory agent, asthma, aphrodisiac, astringent, insomnia and ulcers. Animal studies also show the plant used for treatment of, Parkinson's disease, neurological disorders and inflammation. Whereas *R. serpentina* has been using as an anticancerous, antioxidant, antidiuretic, antidysentry, antiarrhythmic, antidiarrhoeal, anticontractile, tranquillizing and antihypotensive agent.

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