



Full Length Research Article

QUALITATIVE PHYTOCHEMICAL SCREENING IN DIFFERENT SOLVENTS OF *RAUWOLFIA SERPENTINA* (Linn.) Benth., ex Kurz. STEM

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ABSTRACT

Indian medicinal plant (*Rauwolfia serpentina* (Linn.) were analyzed for their phytochemical constituents. The results revealed the presence of bioactive constituents comprising carbohydrate, glycosides, steroids, alkaloids, flavonoids, saponin and triterpenes. *Rauwolfia serpentina* (Linn.) is a good source of glycosides, alkaloids, flavonoids, and triterpenes. Hence it is used for the extraction of useful drugs.

Key words:

*Rauwolfia serpentina*,  
Phytochemical constituents,  
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INTRODUCTION

Sarpagandha (*Rauwolfia serpentina* (Linn.) Benth., ex Kurz.) is a medicinal plant par excellence (Blackwell, 1990), producing useful alkaloids like reserpine (Sahu, 1983). Various parts of this plant are used to treat human ailments (Ebadi, 2007), in alternative systems of medicine. Sarpagandha is a threatened species found in the sub-tropical regions (Sihag and Nidhi, 2011). The root of *Rauwolfia serpentina* (Linn.) (Apocynaceae) has been used in India for hundreds of years for a host of unrelated ailments. Since 1949, after the English publication of a clinical report by the author on *Rauwolfia serpentina* therapy in fifty cases of essential hypertension, the plant has gained universal acclamation as a useful therapeutic weapon in high blood pressure (Vakil, 1955). Some important chemical substances found in *Rauwolfia serpentina* (Linn.) were alkaloids, carbon compounds, hydrogen, nitrogen, glycosides, essential oils, fatty oils, resins, mucilage, tannins, gums and others (Pandey, 1980). Most of these are potent bioactive compounds found in medicinal plant parts that can be used for therapeutic purpose

or which are precursors for the synthesis of useful drugs (Sofowara, 1993). The active principles differ from plants to plants due to their biodiversity and they produce a definite physiological action on human body. Phytochemical analysis of this plant has been a popular research field for many decades and several works have been carried out in this area (Shimolina et al., 1984).

MATERIALS AND METHODS

Collection of plant material

The plants of *Rauwolfia serpentina* Linn. Benth ex.Kurz. were collected from Keeriparai (India). They were identified and authenticated by Dr. Karuppusamy, Botanist, Madura College (Autonomous) Madurai, India. The stem were excised from the plants, washed with running tap water and dried in shade for few days. Dried stem were coarsely powdered and subjected for extraction. The dried powdered material was subjected to successive organic solvent extraction by refluxing in Soxhlet apparatus each for 24 hours. The solvents used polar consisting of aqueous, methanol and ethanol. Each fraction was collected when no further elution of compounds was observed. The collected extracts were subject to vacuum

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drying and stored in sterile containers in the refrigerator till further analysis (Sofowara, 1993). The extracts were analyzed for the presence of carbohydrate, protein, glycosides, steroids, alkaloids, flavonoids, phenols, tannins, saponin and triterpenes, using standard protocols – carbohydrate (Benedict's and Fehling's A, B reagent), protein (Xanthoprotein and Biuret), alkaloids (Mayer's and Dragendorff's), flavonoids (Alkaline reagent and lead acetate), glycosides (Keller – Killiani and Legals) steroids and triterpenes (Salkowski and Liebermann Burchardt), tannins and phenolics (Ferric Chloride and Lead Acetate) saponin (foam test) (Khandelwal 2002; Kokate 1991).

## RESULTS AND DISCUSSION

Qualitative phytochemical screening in *Rauwolfia serpentina* stem were analyzed in three different solvents Aqueous, Methanol and Ethanol were recorded in Table 1. Results showed that carbohydrate and alkaloids were present in all the three solvent extracts. Alkaloids are very important in medicine and constitute most of the valuable drugs. They have marked physiological effect on animals (Edeoga and Eriata, 2001). Protein, tannins and phenolic compounds were absent in all the three tested solvent extracts. Presence of phytochemical constituents such as alkaloids, flavonoids, tannins and phenolic compounds have been reported to be important compounds in many other plants (Burapedjo and Buncho, 1995).

Glycosides were present in methanol and ethanol, and absent in aqueous. Steroids were present only in ethanol extract. Flavonoids were present in aqueous and methanol, absent in ethanol. Flavonoids are potent water - soluble antioxidants and free radical scavengers, which prevent oxidative cell damage, have strong anticancer activity (Okwu and Okwu, 2004). Saponin were present only in aqueous and absent in methanol and ethanol. Saponins along with other flavonoids, polyphenols, tannins and coumarins were shown to be responsible for different antimicrobial effects of plant extract (Laure et al., 2007). Triterpenes were present in aqueous and methanol solvents.

**Table 1. Qualitative phytochemical screening in *Rauwolfia serpentina* (Linn.) stem**

Sl.No	Phytochemical Constituents	Aqueous	Methanol	Ethanol
1	Carbohydrate	+	+	+
2	Protein	-	-	-
3	Glycosides	-	+	+
4	Steroids	-	-	+
5	Alkaloids	+	+	+
6	Flavonoids	+	+	-
7	Phenols	-	-	-
8	Tannins	-	-	-
9	Saponin	+	-	-
10	Triterpenes	+	+	-

Presence = (+), Absent = (-)

## Conclusion

This study provided some phytochemical basis for the ethnomedicinal use of extracts from *Rauwolfia serpentina* in the treatment and prevention of infections. As rich source of phytochemicals present, this plant can be a potential source for the extraction of useful drugs.

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