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Analysis of Phytochemical Screening of Withania somnifera Extracts

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Abstract: Withania somnifera is a popular perennial Indian medicinal plant belonging to the family Solanaceae is commonly known as "Ashwagandha", Asgand, Winter Cherry, and Indian ginseng. It is one of the most valued medicinal plants which have been widely used as therapeutic agents such as anti-inflammatory, antibiotic, antitumor, immunomodulatory, anti-stress, anti-oxidant, sedative, alterative, and aphrodisiac. The present study comprises a phytochemical evaluation to estimate the presence of carbohydrates, glycosides, flavonoids, tannins, phytosterols, and phenolic compounds in Withania somnifera locally available in the local market of Samastipur, India. The aqueous and ethanolic extract samples were used for the phytochemical analysis by using standard chemical tests to find out the phytochemical constituents in the plants. The roots are reported to contain natural bioactive constituent alkaloids, flavonoids, and phenolic compounds. The present study will help in assessing the quality and purity of a crude drug and laying down pharmacopeial standards for *Withania somnifera.*

Keywords: Withania somnifera, ashwagandha and antibiotic

I. INTRODUCTION

Withania somnifera is a shrub belonging to the Solanaceae family and is one of the most commonly used herbal medicines. It is also known as “Ashwagandha” in Sanskrit means “the smell of horses”. This name originated from the smell of its roots, which resembles a sweaty horse. The species name somnifera means sleeping pill indicating that it is assigned sedative properties but it has also been used for sexual activity [1]. It is an important perennial plant with many therapeutic applications in conventional and modern medicine [2]. W. somnifera is gaining attention in various fields of research because it is best suited to current environmental conditions. The numerous antioxidant properties of W. somnifera and its capacity to improve memory are utilized [3]. Because of the medicinal properties of the roots, the species is also known as ‘Indian Ginseng’ [4].

Plants have been a valuable source of natural products for maintaining human and animal health. *W. somnifera* (Solanaceae) is gaining attention in various field of research, as they are best suited to the present environmental conditions. *W. somnifera* is used for its antioxidant12, memory-improving effects, anti-inflammatory effect and analgesic effect [5,6,7,8]. It shows relaxant and antispasmodic effects against several plasmogens on intestinal, uterine, blood vascular, bronchial and tracheal muscles. Withanolides possess remarkable antibacterial, anti-arthritic and immunosuppressive. The anti-tumor and radio sensitizing effects of *W. somnifera* have been studied [9]. The root of *W. somnifera*, known as Indian ginseng (Ashwagandha), has been described in Ayurvedic folk medicine to have potent aphrodisiac, sedative, and energy-enhancing tonic properties [10,11]. Moreover, it is beneficial in the treatment of arthritis, cough, geriatric problems, stress, rheumatisms and male sexual dysfunctions [12].

II. MATERIALS AND METHODS

Collection of ashwagandha, Withania somnifera Withania somnifera dried root powder was purchased from local market of Samastipur, Bihar. The powder was stored in the air tight plastic containers for further use in the experiment.

a) Preparation of alcohol soluble extract

Dried powder of *Withania somnifera* (5 g) was macerated with ethanol (100 ml) in a closed flask for 24 hours with occasional stirring during the first 6 hour. Then it was allowed to stand for 18 hour and then filtered swiftly to prevent any loss during evaporation. Evaporate approximately 25 ml of the filtrate in a porcelain dish and dried at 105°C and weighed.

b) Preparation of water-soluble extract

Weighed quantity of the dried powder of *Withania somnifera* (5 g) was soaked with water (100 ml) in a closed flask with frequent shaking for the first 6 hour and allowed to stand for 18 hours. After that, it was filtered taking precaution against loss of water. Evaporate 25 ml of filtrate in a tared flat shallow dish and it was dried at 105°C and weighed [13].

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Phytochemical Evaluation

The freshly prepared ethanolic and aqueous extracts of Withania somnifera were qualitatively analysed for the presence of phytochemical constituents. The extracts were tested for the presence of alkaloids, tannins, Saponins, cardiac glycosides, steroids, phenols and flavonoids according to standard protocols for detecting the presence of different chemical constitutes in the plant extracts [14].

III, RESULT & DISCUSSION

Phytochemical analysis of Ashwagandha (*Withania somnifera)*

The details of the results of the qualitative analysis of phytochemicals in water and ethanolic crude extract of ashwagandha root powder are presented in Table 1. Phytochemical screening of the root powder of Withania somnifera indicates the presence of carbohydrates, Starch, tannin, saponin, glycoside, phenol, and alkaloid. Aqueous extract contains amino acids, flavonoids, and saponins while ethanolic extracts indicate the presence of saponin, alkaloids, phenolics, glycosides, starch, terpenoids, and flavonoids. Findings are similar to the results of both the quantitative and qualitative analysis of ashwagandha root powder [15]. They also determined the presence of heavy metals as well as inorganic matter in the root powder.

Table 1
Phytochemical screening of Ashwagandha (*Withaniasomnifera*)

S. No.	Secondary Metabolites	Aqueous	Ethanol
1	Phenolics	-	+
2.	Alkaloids	-	+
3.	Saponin	+	+
4.	Tannin	-	-
5.	Glycosides	-	+
6.	Carbohydrates	-	-
7.	Flavonoids	+	+
8.	Amino acid	+	-
9.	Terpenoids	-	+
10.	Starch	+	+

IV CONCLUSION

The present investigation concluded that the plant Withania somnifera contains a variety of Phyto constituents like phenolic compounds, alkaloids, saponin, tannins, glycosides, carbohydrates, flavonoids, amino acids, terpenoids, and starch. The study revealed the presence of medicinally important constituents which can be confirmed by the utilization of roots for therapeutic medical treatment of diseases without any side effects. This phytochemical screening provides knowledge in the identification authentication of Withania somnifera and results are further useful for the isolation of various compounds from herbs for the treatment of diseases.

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