



A STUDY TO EVALUATE THE AVAILABILITY OF PHYTOCHEMICALS IN LEAF EXTRACT OF *Solanum nigrum L*, COLLECTED FROM THE REWA DISTRICT.

****AUTHOR 1-** Suman Singh, Research scholar, Dept. of Chemistry, APS University, Rewa (M.P.)

AUTHOR 2- Dr. Neelam Richhariya, Professor, Department of Chemistry Govt. Girls Degree College,
Satna (M.P.)

Abstract

The main purpose of this study was to evaluate the phytochemical screening on leaf extract of *Solanum nigrum L*. The phytochemical constituents like tannins, proteins, alkaloids, flavonoides and saponins of these species in dry and shady areas were investigated qualitatively. The results reveal that the proteins and alkaloids are more abundant respectively of shady areas. Tannins and Alkaloids are also abundant. Other phytochemical constituents such as saponins, flavonoides are more or less presence in these species of the study areas with proteins, alkaloids and tannins. *Solanum Nigrum* plant is an important medicinal plant. The present study deals with the analysis of Phytochemical constituents such as Alkaloids, flavonoids, glycosides, steroids, carbohydrates, protein, and amino acids were analysed. Alkaloids, flavonoids, Phenolic, diterpines and saponin were present in ethanol extracts of the plant. These phytochemical constituents used for treatment of many diseases. This plant can be utilized and used in the pharmaceutical and cosmetic industries.

Keywords: Phytochemicals, *Solanum nigrum L*, proteins, alkaloids and tannins

1.INTRODUCTION

Plants are playing an important role in the drug sections. Homeopathy, Ayurveda and in traditional medicine since time immemorial. Now- a-days plants are playing a significant role in modern medicine study. These plants are used in various researches and have very low side effects than the synthetic drugs.⁽¹⁾ Now-a-days traditional folk medicines which are obtained from natural sources are used by 85% population in developing country. In INDIA , about 90% populations are living in rural areas near to the natural resources.⁽²⁾ Medicinal plants contain various complex chemical substances of different composition. Medicinal plants provide the raw materials which are helpful for internal pharmaceuticals.⁽³⁾ During this time the phytochemicals research is very helpful to find out new anti-infective agents from higher plants considering physiological action.⁽⁴⁾ We should know about the chemical constituent of plant because knowledge about these may help us to discover the actual valuable remedies.⁽⁵⁾ Photochemical and polyphenols (phenolic acid, Hydrolysable tannins and Flavonoids)⁽⁶⁻¹⁰⁾ show antioxidant properties, anti-carcinogenic and anti-mutagenic effects. The bioactive chemical constituents into plants like alkaloids, tannin, flavonoids, phenolic composition etc. are responsible for physiological and biochemical actions in the human body.⁽¹¹⁾

Natural products from plants are also show antitumor and antioxidant activity⁽¹²⁾. Plant constituents have ecological and physiological role. *Solanum nigrum* L is an annual herbaceous plant which belongs to the family Solanaceae.⁽¹³⁾ Usually black nightshades are considered for this. These plants are usually 10 to 15 cm long, with a semi-climbing, green, smooth stem. The opposite leaves are uniformly oval in shape and are slightly clogged⁽¹⁴⁾. It is widely found in the river bund, wet woods, waste land, quagmire, old field, ditches road side and in wet cultivated land. From top to bottom these herbs are 1-2 cm tall.⁽¹⁵⁾ A lot of hairy pilose are attached in stem. Leaves are simple 18 to 22 cm long, prickly on both surfaces, flowers are white in color and ripe berry globes are yellow in color⁽¹⁶⁾. It is widely found in the river bund, road sides and waste plus. It can be cultivated in tea fields and it slightly found from other cultivated fields⁽¹⁷⁾.

2.MATERIALS AND METHODS

Plant collection and identification

Fresh samples of *Solanum nigrum L* free from disease were collected. The leaves were washed thoroughly 2-3 times with running tap water⁽¹⁸⁾, leaf material was then air dried under shade. After complete shade drying the plant material was grinded in the mixer, the powder was kept in small plastic bags with proper labeling.

Preparation of aqueous extracts:

In the first grinded leaves materials of 5 gm weighed using an electronic balance & 5gm of plant material were crushed in 25 ml of sterile water,⁽¹⁹⁾ then heat at 50- 60 c and it was filtered using Whatman filter paper no.1.⁽²⁰⁾ then filtrate was centrifuged at 2500 rpm for 15 minutes & the filtrate was collected in sterile bottles and was stored by refrigeration at 5° C until use.⁽²¹⁾

Preparation of plant material

The leaves were washed randomly 5-6 times with fresh water in running temperature. Leaf material was the air dried under sunlight shade. After shade drying the plant material was grinded in the mixture.⁽²²⁾ After this preparation we collected the powder and kept in small plastic bags with proper labeling.

2.1: Extraction of plant material Preparation of aqueous extracts

We weighed 5gm of sample using an electronic balance and 5gm of plant material were crushed in 25ml of sterile water. Then we heat the sample at 50-60 °C and it was filtered by Whitman filter paper no.1. Then centrifuged was done for 15 minutes at 2500rpm. Filtrate was collected in sterile bottles.⁽²³⁾ Then it collected at 5 °c in refrigeration until use

2.2: Preliminary phytochemical analysis

Qualitative phytochemicals analysis of the crude powder of the *Solanum nigrum L* for the tests of phytochemicals as a alkaloid, saponin, tannins, flavonoides and protein ⁽²⁴⁾ etc were made as shown below.

Test for alkaloids

For the performance of alkaloids test we have taken 10ml methanol we took 200mg of plant material

and then filtered. Then 2ml of filtrate were taken and added 1% HCL with steam 1ml filtrate and 6 drops Dragendroffs reagent. Orange precipitates indicated the presence of alkaloids.

Test for saponins

For the test of saponin, approximate 0.5 ml filtered freshly prepared and added 5ml distilled water. It shown frothing persistence that indicated presence of saponins.

Test for tannins

During the test for tannins, 10ml distilled water we took 200mg plant material and then filtered. Then 2 ml of filtered taken and added 2 ml FeCl_3 Blue. Black precipitate indicated the presence of Tannins and Phenols.

Test for flavonoids

During the test of flavonoids, 10 ml ethanol we took 200 mg plant material and then filtered. Then 2 ml of filtered taken and added concentrated HCL and magnesium ribbon. Pink Tomato, Red color indicated the presence of flavonoids Glycoside.

Test of protein

For the testing of proteins, 4-5 ml of plant extract were taken and added few drops of Melons reagent and mixing properly and heat. We found which precipitate was formed and the precipitate turn's brick red after boiling.

3.RESULTS

A small portion of the dried extracts were subjected to the phytochemical test using Kokate (1994) methods to test for alkaloids, glycosides, tannins, saponins, flavonoids and steroids separately for extracts of all samples. Small amount of each extract is suitably resuspended into the sterile distilled water to make the concentration of 1 mg per ml. The outcomes of the results are discussed separately in the table.

Table 1: Result of Phytochemical Screening of Extracts.

S.No	Constituents	A	B	C	D	E
1.	Alkaloids	-ve	+ve	+ve	+ve	+ve
2.	Glycosides	-ve	-ve	-ve	-ve	-ve
3.	Flavonoids	-ve	+ve	+ve	+ve	+ve
4.	Steroids	-ve	-ve	-ve	-ve	-ve
5.	Phenolics	-ve	-ve	+ve	+ve	+ve
6.	Amino Acids	-ve	-ve	-ve	-ve	-ve
7.	Carbohydrate	-ve	-ve	-ve	-ve	-ve
8.	Proteins	-ve	-ve	-ve	-ve	-ve
9.	Saponins	-ve	-ve	-ve	+ve	+ve
10.	Diterpines	-ve	-ve	+ve	+ve	+ve

Note book: - = negative , + = present

In this study table 1 had represented that tannins and protein were present in dry area with moderately presence of Protein in shady area of 3 districts where Tannins were abundant on leaf extract of *Solanum nigrum* L in the shady area of Khulna and Jessore districts and moderately presence in Satkhira. Flavonoids and Saponin were moderately presence in shady area. But alkaloid was abundant in shady area with present.

4.DISCUSSION

In this study the qualitative screening was performed for phytochemical constituents on leaf extract of *Solanum nigrum*L, helped to find out the presence of alkaloids, saponin, tannins, flavonoids, proteins etc. The synthetic derivatives of these constituents are used as medicinal agent, because they have analgesic and antibacterial effects. They have physiological activity into host cell. In recent study, it is proved that the alkaloids content in *Solanum nigrum* L. could be have medicinal values. Saponins are very important glycosides with soapy characteristics. Coagulating red blood cell, precipitating, haemolytic activity, cholesterol binding properties, bitterness and formation of aqueous solution are the properties of saponin. The leaf extract of these plants have also medicinal activity. Tannins (tannic acid) are present in many plant foods. It is water soluble polyphenols and helps to precipitate proteins. By lacking of nutritional, Protein and by precipitating microbial protein tannins prevent, the microorganisms development. For this reason tannins are used as antimicrobial agent [26]. Fungi, Yeast, Bacteria and Viruses cannot grow easily due to tannins. The plants which contain

tannins are helped for inflammation of mouth throat, skin and diarrhoea. Tannins are also helpful for healing of wounds and in flamed mucous membrane. Flavonoids are important to prevent oxidant cell damage having anticancer activity due to water soluble antioxidant and free radical scavengers. Flavonoids have anti-inflammatory activity. So, these plants are used for the treatment of wounds, burn and ulcers. So, these plants have many medicinal properties.

5. CONCLUSION

During performing more test on the crude extract of these plants proper drug development is possible. In this study it is revealed that the leaves of *Solanum nigrum* L, are important natural source for useful drugs. Because these plants contain phytochemicals. In the treatment of many disease these plant can be utilized and used in the pharmaceutical and cosmetic industries.

6. REFERENCE

1. Arokiyaraj, S. Studies on antimicrobial, antioxidant, larvicidal, pesticidal activity and phytochemistry of leaves of alangium salvifolium (l.f) wang. International Journal of Pharmacy and Pharmaceutical Sciences, 2013; 5(2): 86-89.
2. Ashalatha and Gopinath, S. M. Broad spectrum antimicrobial activities and phytochemical analysis of alangium salviifolium flower extract. Global Journal of Research on Medicinal Plants & Indigenous Medicine, 2013; 2(3): 135-141.
3. Ashish kumar sharma, vipin agarwal, rajesh kumar, Arumugam balasubramaniam, anurag mishra and rajiv gupta Pharmacological studies on seeds of alangium salvifolium linn. Acta Poloniae Pharmaceutica n Drug Research., 2011; 68(6): 897- 904,
4. Aubergine, Oxford English Dictionary, Undated. Retrieved: 7 August, 2015.
5. Chandran, Sheela. (March 1, 2014). The Star Online, StarPublications (Malaysia) Berhad. Retrieved 28 November Dr. Hashim devotes a large portion of his timetending to his vegetable plot where spinach, lady's finger, sweet potato, brinjal, sweet corn and long beans grow, 2014.
6. Duraipandiyan V, Ayyanar M, Ignacimuthu S. Antimicrobial Activity of Some Ethnomedical Plants used by Paliyar Tribe from Tamil Nadu, India. BMC Complementary and alternative medicine, 2006, 365.

7. Edeoga HO, Okwu DE, Mbaebie BO. Phytochemical constituents of some Nigerian medicinal plants, African Journal of Biotechnology. 20005; 4(7):685-688.
8. Karthikeyan A, Shanthi V, Nagasathaya A. Preliminary phytochemical and antibacterial screening of crude extract of the leaf of *Adhatoda Vasica* L. Int J Green Pharm. 2009; 3:78-80.
9. Mojab F, Kamalinijad M, Ghaderi N, Vahidipour H. Phytochemical Screening of Some Iranian Plants, Iranian Journal of Pharmaceutical Research. 2003, 77-82.
10. Murugan, T., Antimicrobial Activity of Leaves and Latex Extract of the Herbal Plant *Calotropis gigantea* (Erukku in Tamil). IJBPA, 2012; 1(3): 261-270.
11. Murugan, V., Gulhane, S., Badami, S., Ramanathan, M. and Suresh, B. Androgenic activity of the total alkaloid fraction of *Alangium salviifolium* (Linn.f). Journal of Natural Remedies, 2002; 2(1): 66–70.
12. Okwu DE, Emenike IN. Evaluation of the Phytonutrients and Vitamin content of citrus fruit, Int J Mol Med Adv Sc. 2006; 2(1):1-6.
13. Okwu OE, Okwu ME. Chemical composition of *Spondias mombin* L plant parts, J Sustain Agric Environ. 2004; 6:140-147.
14. Pronob gogoi and M islam. phytochemical screening of *Solanum Nigrum* L *S.myricantus* Dunal from district of upper Assam India. IOSR journal of pharmacy., 2012; 2(3): 455-459.
15. Rabe, T., Staden, J.V. Review on some plant of Indian traditional medicine with antioxidant activity. Journal of Ethnopharmacol., 1977; 56: 81-87.
16. S Karthikumar, K Vigneswari, K Jegatheesan. Screening of antibacterial and antioxidant activities of leaves *Eclipta prostrata* (L) Sci Res Essay. 2007; 2(4):101-104.
17. Sodipo OA, Akiniji JA, Ogunbamosu JU. Studies on Certain characteristics of extracts of bark of *Paninystalia macruras* (K Schemp) pierre Exbeille, Global J Pure Appl Sci. 2000; 6:83-87.
18. Sreekanth, P., Sudhakara, K., Gouse Basha, G., Murali, K., Sanjeeva Kumar, A. Anti Ulcer Effect Of *Alangium Salvifolium* Ethanolic Leaf Extract On Gastric Lesion Induced By Ethanol In Rats. Asian Journal of Pharmaceutical and Clinical Research., 2011; 4(2): 112-114.
19. Tona, L., K. Kambu, N. Ngimbi, K. Cimanga and A.J. Vlietinck, Antiamoebic and phytochemical

- screening of some Congolese medicinal plants. *J. Ethnopharmacol.*, 1998; 61: 57-65.
20. Udaya prakash N.K., Bhuvanewari, S., Preethy S., Rajalakshmi, N., Saranya, M., ruthanto, Jasmine, and S. Arokiyaraj, Studies on antimicrobial, antioxidant, larvicidal, pesticidal activity and phytochemistry of leaves of *alangium salvifolium* (L.F) wang. *International Journal of Pharmacy and Pharmaceutical Sciences*, 2013; 5(2).
21. Upadhyay, R., Trivedi, S., and Mehrotra, N.N., Phytochemical Studies and Antimicrobial Activity of Traditional Medicinal Plant *Alangiumsalvifolium* (L.f.) Wang. *Search & Research.*, 2011; 2(2): 183- 184.
22. Uruguiaga I, Leighton F. Plant poly phenol antioxidant and oxidative stress, *Biological Research*. 2000; 33:159- 165.
23. Vandana, A. Kumar, Atul Kumar, and Jitendra Kumar, In vitro flowering and pod formation in cauliflower (*Brassia oleracea* var. *Botrytis*). *Curr.Sci.*, 1995; 543-545.
24. Westendary H. Effects of tannins in animal nutrition, *Dtsch Tierarztl Wochenschr* 2006; 133(7):264-268.
25. Zubay, G. In vitro Synthesis of Protein in Microbial Systems. *Annu. Rev. Genet*, 1973; 7: 267–87.

****corresponding author-Suman Singh, docmail.1312@gmail.com**

