ISSN 0976 – 3333

Available Online at www.ijpba.info

International Journal of Pharmaceutical & Biological Archives 2015; 6(6): 18 - 20

RESEARCH ARTICLE

HPTLC Studies of Ethanolic Extract of *Diascorea bulbifera*

Asha Jyothi V*[1], Satyavati D[2]

[1]*Dept. of Pharmacology Shadan Womens College of Pharmacy, Khairatbad, Hyderabad, Telangana, India*
[2]*Brilliant college of Pharmacy, Koheda, Near Ramoji film city, Hyderabad, Telangana, India*

Received 10 Sep 2015; Revised 05 Dec 2015; Accepted 17 Dec 2015

ABSTRACT

To establish phytoestrogenic profile for the medicinally important plant *Diascorea bulbifera* using high performance thin layer chromatography (HPTLC). Preliminary phytochemical screening was carried out to identify the presence of chemical constituents of ethanolic extract of *Diascorea bulbifera* bulbil. Ethyl acetate-formic acid-glacial acetic acid-water (100:11:11:26) was employed as mobile phase for flavonoids. TLC Plates dried at 100^{o}C in hot air oven for 3 min. The plate was photo-documented at UV 254 nm. Carbohydrates, proteins, fats, steroids, volatile oils, glycosides, flavonoids and phenolic compounds are present in the ethanolic extract of *Diascorea bulbifera* bulbil. The ethanolic extracts of *Diascorea bulbifera* bulbil displayed the presence of mainly 3 types of flavanoids and related compounds with major 3 different Rf values ranging from 0.22 to 0.85. The ethanolic extract of *Diascorea bulbifera* bulbil illustrated the presence of 3 different types of flavonoids with 3 different Rf values of the peaks at 0.22, 0.50 and 0.85.

Key words: *Diascorea bulbifera*, HPTLC, Chromatography, Ethanolic extract, Rf value and Phytoestrogens.

INTRODUCTION

Plants generally contain primary and secondary metabolites namely alkaloids, terpenoids, flavonoids, saponins, coumarins, glycosides, phenolics, carboxylic acids, amino acids, sugars, proteins etc. These phyto-constituents impart the specific characteristics and properties of plants. Therefore, it is obligatory to resolve all of the phytochemical constituents present in the plants in order to ensure the consistency and repeatability of pharmacological, antimicrobial and clinical research, to understand their bioactivities, identify the active principles (components) and possible side effects of active compounds and to enhance product quality control [1]. These phyto-constituents are estimated quantitatively and qualitatively by a variety of techniques such as spectroscopy and chromatography. Chromatography techniques are the most useful and popular tools used for the qualitative and separation studies. High performance thin layer chromatography (HPTLC) chromatographic fingerprints can be applied for this kind of certification. Finger print analysis by HPTLC has developed into an effective and powerful tool for linking the chemical constituents' profile of the plants with botanical identity and for estimation of chemical and biochemical markers. [2-10]

Dioscorea bulbifera, the Air potato, belongs to yam species. It is also known as Varahi in Sanskrit, Kaachil in Malayalam and Dukkar Kandin Marathi. The Air potato plant is native to Africa and Asia. It is an invasive species in many tropical areas, including Florida**.**

Dioscorea bulbifera is a perennial vine with broad leaves and has two types of storage organs. The plant forms bulbils in the leaf axils of the twining stems, and tubers beneath the ground. These tubers are like small, oblong potatoes, family belong to Solanaceae or Dioscoreaceae, they are edible and cultivated as a food crop, especially in West Africa. It typically climbs to the tops of trees and has a tendency to take over native plants. New plants develop from bulbils that form on the plant, and these bulbils serve as a means of dispersal. The aerial stems of air potato die back in winter season, but resprouting occurs from bulbils and underground tubers. The primary

***Corresponding Author:** Asha Jyothi V, **Email:** ashajyothivadlapudi@gmail.com

means of reproduction through bulbils. The fruits are in capsular form. Air potato has been used as a folk remedy to treat conjunctivitis, diarrhoea and dysentery, among other ailments [12].

MATERIALS AND METHODS

Dried *Diascorea bulbifera* bulbil was procured from the authorized botanist Dr. Madhukar Reddy of Heritage bionaturals, Habsiguda, Hyderabad. Shade dried samples were grounded to fine powder using pulverizer. The powdered samples were then stored in a refrigerator for further use.

The powdered bulbils of *Diascorea bulbifera* were extracted using ethanol with gentle stirring for 72 h separately at room temperature. The extracts were then filtered through Whatmann No. 1 filter paper and concentrated using rotaevaporator.

HPTLC studies were performed at IICT, Hyderabad. All the solvents used for HPTLC analysis was obtained from MERCK. The samples (5 µL) were spotted in the form of bands of width 5 mm with a Camag microlitre syringe on pre-coated silica gel glass plate 60F-254 (20 × 10 cm with 250 µm thickness (E. Merck, Darmstadt, Germany) using a Camag Linomat IV (Switzerland). The plates were pre-washed by methanol and activated at 60^{o}C for 5 min prior to chromatography. The sample loaded plate was kept in TLC twin trough developing chamber (after saturated with solvent vapor) with respective mobile phase (flavanoids) and the plate was developed in the respective mobile phase up to 90 mm. The Ethyl acetate-formic acid-glacial acetic acid-water (100:11:11:26) was employed as mobile phase for flavonoids. Linear ascending development was carried out in 20 cm × 10 cm twin trough glass chamber (Camag, Mutenz, Switzerland) saturated with mobile phase and the chromatoplate development for two times with the same mobile phase to get good resolution of phytochemical constituents. The optimized chamber saturation time for mobile phase was 30 min at room temperature (25 ± 2) ^{o}C. The developed plate was dried by hot air to evaporate solvents from the plate. After the spray of the flvainoids reagents plates are dried at 100^{o}C in the hot air oven for 3min. The plate was photo-documented at UV 366 nm [11].

RESULTS

From the preliminary phytochemical evaluation the constituents like Carbohydrates, proteins, fats, steroids, volatile oils, glycosides, flavonoids and phenolic compounds are present in the ethanolic extract of *Diascorea bulbifera* bulbil. Various combinations of Ethyl acetate-formic acid-glacial acetic acid-water (100:11:11:26) was employed as mobile phase for flavonoids. TLC Plates dried at 100^{o}C in hot air oven for 3 min. The plate was photo-documented at UV 254 nm. . The ethanolic extracts of *Diascorea bulbifera* bulbil displayed the presence of mainly 3 types of flavanoids and related compounds with major 3 different Rf values ranging from 0.22 to 0.85. The ethanolic extract of *Diascorea bulbifera* bulbil illustrated the presence of 3 different types of flavonoids with 3 different Rf values of the peaks at 0.22, 0.50 and 0.85.

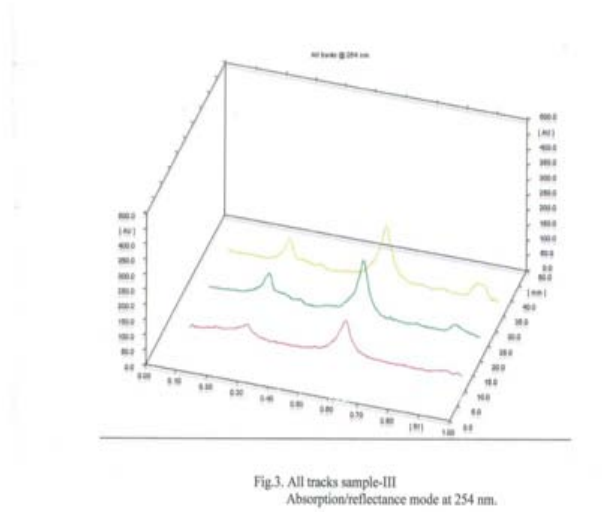

Fig 1: 3D display of HPTLC chromatogram of ethanolic extract of Saraca asoka

DISCUSSION

Secondary metabolites are produced by a large variety of organisms, including bacteria, fungi, plants and animals especially by higher plants for their defensive mechanisms to protect themselves from the biotic and abiotic factors. Flavanoids possess lots of pharmacological and pharmaceutical properties and are used as medicines, as recreational drugs, or in entheogenic rituals[13]. The quality and quantity of the alkaloids present in the plants are varied depending on the type of plants and parts or tissue of the plants.

Dioscorea bulbifera is a perennial vine with broad leaves and has two types of storage organs. The plant forms bulbils in the leaf axils of the twining stems, and tubers beneath the ground. These tubers are like small, oblong potatoes, family belong to Solanaceae or Dioscoreaceae, they are edible and cultivated as a food crop, especially in West Africa. It typically climbs to the tops of trees and has a tendency to take over native plants. New plants develop from bulbils that form

on the plant, and these bulbils serve as a means of dispersal. The aerial stems of air potato die back in winter season, but resprouting occurs from bulbils and underground tubers. The primary means of reproduction through bulbils. The fruits are in capsular form. Air potato has been used as a folk remedy to treat conjunctivitis, diarrhoea and dysentery, among other ailments [12].

The results of the present study authenticates and confirms the ayurveda usage, traditional practices, ethnobotanical, anti-microbial and pharmacological values of the medicinally important plant *Diascorea bulbifera* bulbil and suggest that the leaves extracts of *Diascorea bulbifera* bulbil possess compounds with bioactivity properties that can be used as active principles or agents in new drugs for the therapy of infectious diseases. A recent review proves that the HPTLC techniques can be used to rectify many qualitative and quantitative analytical problems in a wide range of fields including medicines, pharmaceutical, chemistry, biochemistry and toxicology [13]. In addition, HPTLC was recommended for identification of the medicinal plants and finds solution for the taxonomical problems [8-10]. Similar to the previous observations, in the present study we produced the HPTLC profile for the various organic solvent extracts of in practical use as a pharmacogonstical tool to identify this medicinally important plant. In addition it can be adopted as a chemo-taxonomical tool in the plant systematic. Further, the separation and characterization of the bioactive compound (principles) from the plants is to be evaluated and reported in near future.

REFERENCES

1. Amani M, El-Mousallamy D. Leaf flavonoids of Albizia lebbeck. Phytochemistry 1998; 48(4): 759 -761.
2. Dash S, Das C, Sahoo DC. Phytochemical and anthelmintic screening of crude bulbil extract of Adenanthera pavonina Linn. Int J Compr Pharm 2010; 2(10): 1-4.
3. Patil AG, Koli SP, Patil DA, Chandra N. Pharmacognostical standardization and HPTLC fingerprint of Crataeva tapia Linn. SSP. Odora (Jacob.) Almeida leaves. Int J Pharm Biosci 2010; 1(2): 1-14.
4. Ramya V, Dheena Dhayalan V, Umamaheswari S. In vitro studies on antibacterial activity and separation of active compounds of selected flower extracts by HPTLC. J Chem Pharm Res 2010; 2(6): 86-91.
5. Tripathi AK, Verma RK, Gupta AK, Gupta MM, Khanuja PSS. Quantitative determination of phyllanthin and hypophyllanthin in phyllanthus species by high-performance thin layer chromatography. Phytochem Anal 2006; 17: 394–397.
6. Manikandan A, Victor Arokia Doss A. Evaluation of biochemical contents, nutritional value, trace elements, SDS-PAGE and HPTLC profiling in the leaves of Ruellia tuberosa L. and Dipteracanthus patulus (Jacq.). J Chem Pharm Res 2010; 2(3): 295-303.
7. Sharma RJ, Chaphalkar SR, Adsool AD. Evaluating antioxidant potential, cytotoxicity and intestinal absorption of flavonoids extracted from medicinal plants. Int J Biotechnol Appl 2010; 2(1): 01-05.
8. Yamunadevi M, Wesely EG, Johnson M. Chromatographic finger print analysis of steroids in Aerva lanata L by HPTLC technique. Asian Pac J Trop Biomed 2011; 1: 428-433.
9. Yamunadevi M, Wesely EG, Johnson M. Chemical profile studies on the alkaloids of medicinally important plant Aerva lanata L. using HPTLC. J Nat Conscientia 2011; 2(2): 341-349.
10. Yamunadevi M, Wesely EG, Johnson M. A chromatographic study on the glycosides of Aerva lanata L. Chin J Nat Med 2011; 9(3): 210−214.
11. Bobby. N. MD, Weseley. EG, Johnson.M, High performance thin layer chromatography profile studies on the alkaloids of Albizia lebbeck, 2012 S1-S6
12. Jyothi. VA, Pippalla. S.R, Satyavathi.D. *Diascorea bulbifera* – A Review, IJPT, July-2012, Vol. 4 (2), 2157-2163.
13. Gupta RS, Kachhawa JB, Chaudhary R. Anti-fertility effects of methanolic pod extract of Albizia lebbeck Benth. in male rats. Asian J Androl 2004; 6(2): 155-159.