World Journal of Pharmaceutical and Life Sciences
WJPLS
www.wjpls.org
SJIF Impact Factor: 4.223

ANATOMICAL AND PHYTOCHEMICAL STUDY OF *GEODORUM DENSIFLORUM* (LAM.) SCHLTR USED AS APHRODISIAC

P. S. Baghel*[1] and Dr. Sudip Ray[2]

[1]Department of Botany, Govt. M.G. College, Jawad, Neemuch (M.P.) Pincode-458330, India.
[2]Department of Botany, PMB Gujrati Science College, Indore (M.P.) Pincode-452001, India.

***Corresponding Author: P. S. Baghel**
Department of Botany, Govt. M.G. College, Jawad, Neemuch (M.P.) Pincode-458330, India.

Article Received on 10/08/2017 **Article Revised on 31/08/2017** **Article Accepted on 21/09/2017**

ABSTRACT

Preliminary phytochemical screening and anatomical study of *Geodorum densiflorum* (Lam.) Schltr have been carried out. Preliminary phytochemical screening shows the presence of alkaloids, saponin, steroids, flavonoids in ethanolic & aqueous extract of these plant. Root shows Rhizoderm, velamen, cortex and vascular bundles in T.S. Single layered thin epidermis, cortex, vascular bundles and pith are clearly observed in T.S of pseudobulb. Anatomical and phytochemical study will definitely be helpful for scientific validation of investigated plant.

KEYWORDS: Morphology, Trichomes, Stomata, Anatomy, Rhizome, Tuber, Impotency.

INTRODUCTION

The tribal people have a rich heritage of knowledge on medicinal plants found in the forest. The traditional knowledge on the use of medicinally important plants has been widely acknowledged and valued across the world since few decades. Ancient ethnic communities around the world had learnt to utilize their neighboured herbal wealth for their health care (Subramannium and Pushpagadan, 1995). Many modern drugs has been discovered from plants which are used by indigenous people (Balick and Cox, 1996). All plant parts are considered as potential sources of medicinal substances (Shankar and Ved, 2003).

People have been using medicinal plants for male impotency since time immemorial. Various substances of plant origin have been administered in folk medicine of different culture to energize, vitalize and improve impotency or in fertility. It is a pseudobulbous plant. Pseudobulb is ovoid to conical with transverse circular bands. Dried tubers are used in impotency (Tiwari et al,2012). Pseudobulb of the plant is ethnomedicinally used for the treatment of various diseases (Dash et al,2008). Tuber paste is used in arthritis (Chodhary,2014) .Powder of tuber is used to cure male impotence (Alawa et al,2016).

Literature study reveals that few research papers are available on plant improving fertility or impotency in men. (Evans,1969; Pallavi et al, 2011; Neychev, 2005; Thakur et al 2009; Suresh kumar et al,2000; Gauthaman et al, 2002; Patel et al,2011; Sabna et al, 2013). An attempt was made to investigate the preliminary phytochemical screening and anatomical study of *Geodorum densiflorum* (Lam.) Schltr Which is used as aphrodisiac in traditional system of medicine.

METHODOLOGY

Fresh parts (Leaves, Stem, Seeds and Bark) were collected in different seasons. Plants were shed dried and plant extracts were prepared using standard method (Harborne, 1998). The powdered plant material was extracted with different solvents (Ethanol and Water/Aqua) using soxhlet apparatus. The crude extract obtained was further dried over water bath. Different qualitative tests were performed for screening the presence of various active chemical constituents. These tests are Alkaloids (Mayer's test), Glycosides (Borntragers test), Carbohydrates (Benedicts Test and Barfoed Test), Protein and Amino Acids (Biuret and Ninhydrin test), Flavonoids (Lead acetate test, alkaline reagent test, shinoda test), Triterpenoids and Steroids (Salkowaski's, Libberman and Burchard's test), Tanin and phenolic compounds (Ferric Chloride test, Lead acetate test, Iodine solution test, Gelatine test).TLC was performed and Rf values were determined following customary method(Trease and Evans 1989, Kokate, 2006).Fresh plant materials were collected and preserved in 5% fomaline for anatomical investigation. Suitable thin sections were double stained and observed under research microscope. Photographs were snapped out.

Morphology

Plants 25 to 35 cm tall .Pseudobulb tuberous, irregularly ellipsoid to triangular ovoid borne on short rhizome forming dense cluster. Leaves alternate sessile ,sheathing leaf base oblong lanceolate15-21*3.5-4.5cm acuminate. Flower pinkish white, 12-14 flowered decurved raceme. Caplsules pendulous, fusiform. Seeds minute rounded brownish.

Figure 1: Geodorum densiflorum.

Figure 2: Pseudobulb with aerial root.

OBSERVATION

T. S. of Root

Root shows Rhizoderm, velamen, cortex and vascular bundles in T.S. Rhizoderm is the outer layer. Below this Velamen tissues are found below the rhizoderm. Cells of velamen are polygonal and radially oblong. Many layered cortex is present below the single layered endodermis. Vascular bundles are seen below cortex. Vascular bundles are circular, circular and closed

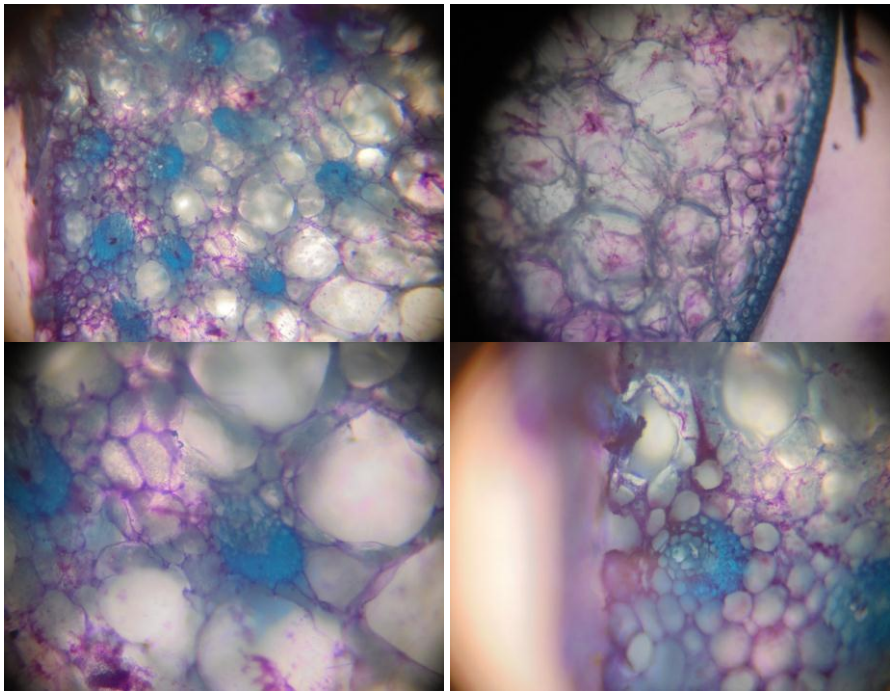

Figure 3: T. S. of root.

T. S. of Pseudobulb

Single layered thin epidermis, cortex, vascular bundles and pith are clearly observed in T.S of pseudobulb. Epidermis is single layered and thin. Cortex lie below epidermis, cortex contains some polygonal parenchymatous cell. Vascular bundles collateral circular and scattered vascular bundles which are found embedded throughout cortex. Xylems are angular lignified parenchymatous tissues are spread over cortex.

Figure 4: T. S. of pseudobulb.

Table 1: Phytochemical Screening of Geodorum densiflorum.

S. No.	Name of the Phytochemical	Name of the test	Ethanol Extract	Aqueous Extract
1	Glycosides	Borntrager's Test	-ve	-ve
2	Alkaloides	Mayer's Test	+ve	+ve
		Hager's Test	+ve	+ve
		Wager's Test	+ve	+ve
3	Carbohydrates	Fehling Test	+ve	+ve
		Benedict's Test	+ve	+ve
		Barfoed's Test	-ve	-ve
4	Protiens and Amino Acids	Biuret's Test	-ve	-ve
		Ninhydrin Test	-ve	-ve
5	Flavonoids	Lead Acetate Test	+ve	+ve
		Alkaline Reagent Test	+ve	+ve
		Shinoda Test	+ve	+ve
6	Triterpenoids and Steroids	Salkowski's Test	+ve	+ve
		Libbermann burchard's Test	+ve	+ve
7	Tanin and Phenolic Compounds	Ferric Chloride Test	-ve	-ve
		Lead Acetate Test	-ve	-ve
		Dilute Iodine Solution Test	-ve	-ve
		Gelatin Test	-ve	-ve

+ve = Present and –ve = Absent

RESULT AND DISCUSSION

Qualitative tests were performed and various phytoconstituents were observed (Table-1). Ethanolic and aqueous extract showed the presences of Alkaloids, Carbohydrate Flavonoids, Triterpenoids and steroids in investigated plant. TLC study was carried out in different developers.

Solvent 1, developers (chloroform: Ethyl acetate 60:40) and Solvent 2 developers (chloroform: Acitone: formic acid= 75:16.5:8.5) and different Rf values were observed (Table-2).

By taking the help of Rf value in different solvent system there are ten values of Rf in solvent system 1 while in solvent system 2 there are sixteen Rf values .It leads that tentatively fractions of ten leading phytochemicals are present in *Geodorum densiflorum*. The RF values in two system suggest the presence (range from 0.5 to 0.9) of higher alkaloids, carbohydrate, flavonoids and contain amino acid supporting by chemical test using different specific reagents for natural products. They have their specific biochemical role in plants. The spots corresponding to Rf value between 0.9 to 0.8 usually belongs to Phenyl ethyl amine group alkaloids. The possibility of ephedrine and nicotine is assumed. Among flavonoids Hirsutidine chlorides and Quercetine as middle range of Rf values in both system.

Table 2: Rf value of ethanol extract.

S. No.	Solvent 1 (chloroform: Ethyl acetate 60:40)	Solvent 2 (chloroform: Acitonic formaldehyd 75:16.5:8)
1.	0.962	0.925
2.	0.937	0.913
3.	0.900	0.851
4.	0.837	0.814
5.	0.800	0.765
6.	0.750	0.703
7.	0.687	0.654
8.	0.325	0.629
9.	0.262	0.604
10.	0.087	0.580
11.		0.543
12.		0.518
13.		0.493
14.		0.444
15.		0.160
16.		0.111

Table 2: Rf value of aqueous extract.

S. No.	Solvent 1 (chloroform: Ethyl acetate 60:40)	Solvent 2 (chloroform: Acitonic formaldehyd 75:16.5:8)
1.	-	0.951
2.	-	0.890
3.	-	0.670

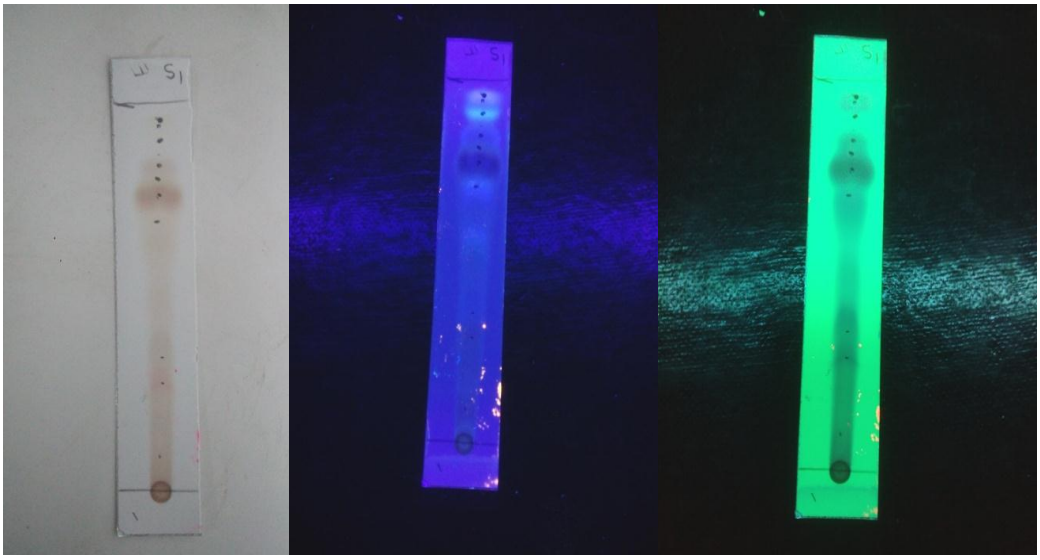

Figure 5: TLC plates of Ethanol Extract solvent 1.

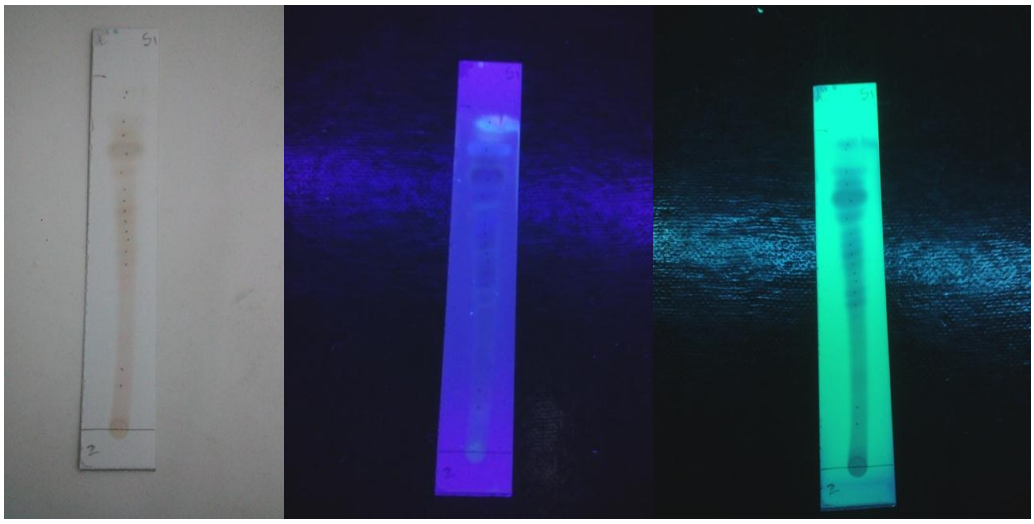

Figure 6: TLC plates of Ethanol Extract solvent 2.

CONCLUSIONS

Phytochemical screening of *Geodorum densiflorum* reveals that the maximum classes of phytoconstituents alkaloids and flavonoides are present in both ethanolic as well as aqueous plant extract. Anatomical and phytochemical study will definitely be helpful for scientific validation of investigated plant.

ACKNOWLEDGEMENTS

First author would like to extend deep sense of gratitude to Dr.D.L.Ahir Principal, Govt M G College, Jawad for giving permission to pursue research work and kind support. We are very much grateful to Dr Anil kumar Gharia, retired professor of Chemistry, PMB Gujarati Science College for his arduous and painstaking help. First author would like to express gratitude and sincere thanks to Principal and Head of Botany Department, PMB Gujarati Science College, Indore for library and laboratory facilities. First author is also thankful to all faculty members of Department of Botany, PMB Gujarati Science College for cooperation. Help and laboratory facilities provided by Sourabh Jain, Chief Administrative Officer PBRI, Bhopal and the Director of Sagar Institution of Research Technology-Pharmacy, Bhopal are gratefully acknowledged.

REFERENCES

1. Alawa KS, RaySudip and Dubey Anuradha. Folklore claims of some ethnomedicinal plants used by Bhil tribes of Dhar district, Madhya Pradesh. bioscience discovery, 2016; 7(1): 60-62.
2. Subramaniam A, P Pushpagadhan, S.Rajesekharan, PG Latha Anli pyretic activity of tbr-002, a herbal formulation Ancient science of life, 1995; 15(1): 7-14.
3. Balick J.M. and Cox P A. Plants, people and calture, the science of ethnobotany Scientific Am. Lib, New york, 1996; 228-235.
4. Choudhary T, De sarkar D and Roy Chandra S. Local folk of plants in Dinajpur district of West Bengal, India. International Research Journal of Biological Sciences, 2014; 3(5): 67-79.

5. Harborne J.B. Methods of Phytochemistry, Chapman and Hall Ltd London, 1998; 110-113.
6. Krishnaiah, D, Devi T, Bono, A, Sarbathy R. Studies on phytochemical constituents of six Malayasian plants. D.Med. Plant-Res, 2009; 3: 067-072.
7. Evans WO, Chemical Aphrodisiacs Psycho Pharmacol Bull, 1969; 5(2): 10-17. Pub Med.
8. Galle G.Trummer H. The etiology of erectile dysfunction and mechanism by which drugs improve erection. Drugs today (Barc), 2003; 39: 193-202. (Pub Med).
9. Pallavi K J, Ramadeep S, Sarbjeet.S, Kavam S, Mamta F, Vinod S. J aphrodisiac agents from medicinal plants: A review. J.Chem Pharm. Res, 2016; 3: 911-21.
10. Neychev VK, Mitevvl, 2000. The aphrodisiac herb. Tribulus terorestris does not influnce the ad an drogen production in young men. J.Ethnopharmacal, 2005; 101: 319-23.
11. Rao S.1979.Orchids of India National Book Trust, New Delhi.
12. Thakur M, Chouhan N S, Bhargavas, Dixit VK. A comparative study on aphrodisiac activity of same ayurvedic herbs in male albino rats Arch. Sex. Behav, 2009; 38: 1009-15.
13. Suresh-Kumar PK, Subramoniam A, Pushpangadan P. Aphrodisiac activity of Vanda tessellate (Roxb.) hook. Ex don extract in male mice. Ind. J. pharmacol, 2000; 32: 300-4.
14. Tiwari A, Joshi B and Ansari A. A less known ethnomedicinal uses of some orchids by the tribal inhabitants of Amarkantak plateau, Madhy Pradesh, Nature and science, 2012; 10(12).
15. Gauthamark, Adai Kan PG, Prasad RN Aphrodisiac properties of Tribulus terrestris extract (Protodioscin) in normal and castrated rats. Life Sci, 2002; 71: 1385-96.
16. Madan CL, Kapur BM Gupta US. Crocus Sativus Saffron herb and sexual effects. Saffron, Econ Bot, 1996; 20: 377.
17. Patel DK Kumar R Prasad SK, Hemalatha S. Pharmacologically Screened aphrodisiac plant. A review of current scientific literature Asia Pac J. Trop Biomed, 2011; 1: 5131-8.
18. Saban Kotta, Shahid H. Ansari, And Javed Ali. Exploring Scientifically proven herbal aphrodisiacs, Pharmacognosy Review, Jan-Jan 2013; 7(13): 1-10.
19. Kokate C.K. Purohit A.P., and Gokhale S. B. Pharmacognosy; 23 ed, Nirali prakashan, 2006; 493-497.