wjpls, 2018, Vol. 4, Issue 12, 146-149 Research Article ISSN 2454-2229

World Journal of Pharmaceutical and Life Sciences
WJPLS
www.wjpls.org SJIF Impact Factor: 5.008

PHYTOCHEMICAL ANALYSIS AND ANTIMICROBIAL ACTIVITY OF DIOSCOREA BULBIFERA (L.) KUNTH

Dr. Manmohan S. Bhaisare*

Late, Nirdhan Patil Waghaye Science College Lakhani Dist. Bhandara, (M. S.).

***Corresponding Author: Dr. Manmohan S. Bhaisare**
Late, Nirdhan Patil Waghaye Science College Lakhani Dist. Bhandara, (M. S.).

Article Received on 18/10/2018 **Article Revised on 09/11/2018** **Article Accepted on 30/11/2018**

ABSTRACT

Dioscorea bulbifera, a climber of family Dioscoreaceae. Widely distributed around the world in tropical and subtropical regions, a plant where collected by forest near lakhani village. The bulb of this clamber called air potato has been used as a folk remedy to treat conjunctivitis, diarrhea, and dysentery. It also has anti-cancer properties. The present study deals with qualitative phytochemical analysis and antimicrobial activity of dioscorea bulbifera. The crude extract of air potato showed alkaloids, phytosterols, protines, giycosides, tannins, saponnin and antimicrobial activity against Bacillus subtilis, Bacillus cereus, Staphylococcus aureus, Pseudomonas aeruginosa, salmonella typhi and Escherichia coli.

KEYWORD: Phytochemical analysis, Antimicrobial activity, dioscorea bulbifera (L.)Kunth.

INTRODUCTION

Dioscorea bulbfera, (L.) Kunth. Family- Dioscoreaceae, Locally known as Mattnaru.Air potato of this plant called Mattnaru is a major stapal food of tribal people.

Dioscorea bulbifera have been traditionally used to lower glycemic index, thus providing more sustained form of energy and better protection against obesity and diabetes. It also has anti-cancer properties. (Suriyavathana & Indupriya, 2011).

Dioscorea bulbifera a perennial climber with stem twining to left bearing bulbils in leaf axils. Leaves simple, cordate, capsule oblong, seed winged at base only. Both tuber and bulbils of wild races have medicinally uses, they are used externally, usually as a poultice, to treat wound, sores, boils and inflammation, in dressing for treating dermal parasitic and fungal infection., or crushed, mixed with palms oil, and massaged onto areas of rheumatism and for troubles for the breast.

In India the tuber is considered to be diuretic and to be a remedy for diarrhoea and haemorrhoids. The fruits are also used to treat boils and for fever. The leaves are used, often steam distillation, against pink eye. (Tropical plant Database, 2018).

Thus the plant provided a source of inspiration for novel drug compound as plant derived medicines have made significance contribution toward human health, so the present study deals with qualitative phytochemical analysis and anti-microbial activity of such a plant.

MATERIAL AND METHOD

The air potato of Dioscorea bulbifera, (L.) Kunth, were collected form forest area of Lakhani village during, 2015. The plant specimen were identify and authenticated and deposited in the department of Botany, Late. N. P. W. College lakhani, District Bhandara (M.S.).

The air potato of Dioscorea bulbifera were washed under running tap water, cut in to pieces, shade dried and then homogenized to fine powder and stored in airtight bottles.

Preparation of Crude Extract

Different solvent like Acetone, Benzene, Chloroform, Petroliam ether, Ethonol, Water where chosen for successive extraction based on polarity using Soxhlet extraction apparatus and the extract of Air potato, Dioscoria bulbifera where concentrated under reduced presser using rotary evaporator (Gunasekaran and Selverajan, 2009).

Phytochemical Test

Solvent free extract obtained as above was then subjected to qualitative test for identification of plant constituents of each sample.

Off. Principal
Late. N.P.W. College
Lakhani, Distt. Bhandara

Late N. P. W. College, Lakhani Dist. Bhandara (M.S.) Ref No.----- Dt.

Standard phytochemical screening method were adapted to each plant extract, so as to test them for alkaloids, phytosterols, protines, giycosides, tannine, sponnine, following the techniques of Horborne (1996), Sofowora (1984), Kokate (1994), Evans (2002).

Table 1: Qualitative phytochemical investigation of various extract of Dioscorea bulbifera, air potato, Obtained from successive solvent extraction.

Plant Part Used	Test	Reagents	Acetone	Benzene	Chloroform	Petroliam ether	Ethonol	Water
BULBIL or AIR POTATO	Alkaloids	Mayer's Test	+	+	+	+	+	+
	Phytosterol	Libbermann's Burchard's Test	–	+	+	+	–	+
	Proteins	Biurete Test	+	+	–	–	–	+
	Glycosides	Libbermann's Burchard's Test	+	–	–	+	+	–
	Tannins	Ferric Chloride Test	+	+	+	–	–	–
S	Saponin	Forthin test With Olive oil	+	+	+	+	+	+

(Phytochemical: Present= +, Absent = -)

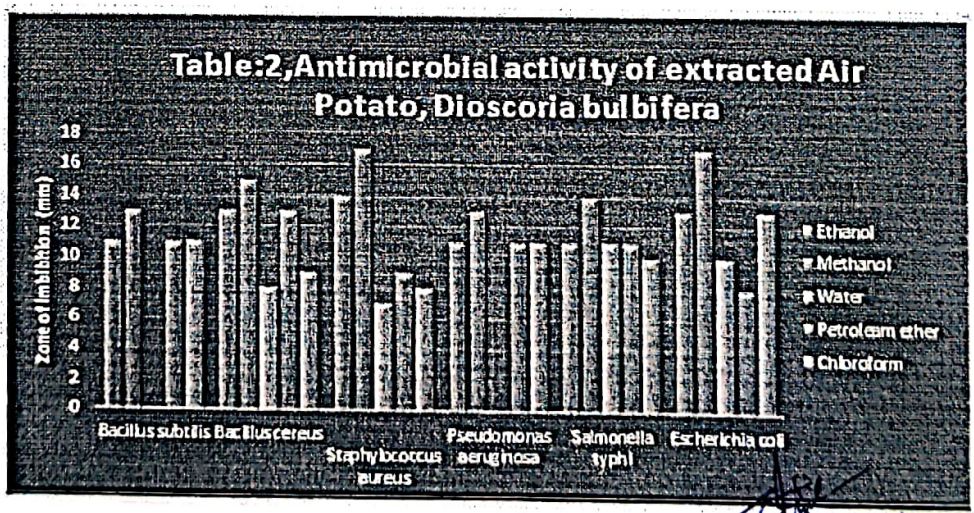
Antibacterial Screening

Test Organism

Authentic cultures of three Gram^{+} ve and Gram- ve bacteria viz., Bacillus subtilis, Bacillus cereus, Staphylococcus aureus, Pseudomonas aeruginosa, salmonella typhi and Escherichia coli. Where obtained from NCL, Pune, India, and they are used for the antibacterial activity against the prepared plant extract.

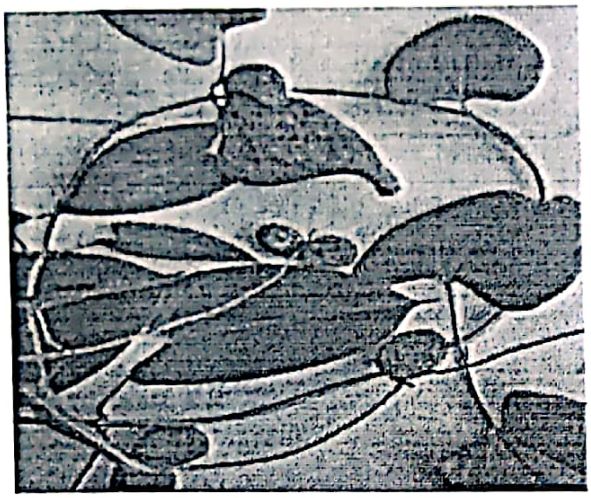
Table 2: Antibacterial activity of extracted of Air potato, Dioscorea bulbifera.

Test Organism	Zone of inhibition (in mm)				
	Ethanol	Methanol	Water	Petroleum ether	Chloroform
Bacillus subtilis	11	13	–	11	11
Bacillus cereus	13	15	8	13	9
Staphylococcus aureus	14	17	7	9	8
Pseudomonas aeruginosa	11	13	–	11	11
salmonella typhi	11	14	11	11	10
Escherichia coli	13	17	10	8	13



Off. Principal
Late. N.P.W. College
Lakhani, Distt. Bhandara

Late N. P. W. College, Lakhani Distt. Bhandara
Ref No.-----
Dt.



Disc Diffusion Method

Antibacterial activity is studied by using the disc diffusion method (Kirby et, al.,1966). the discs where put in a clean dry glass bottle and sterilized at 121^0 C for 15 min.in an autoclave. Both dilution assay was used to screen the extract for antibacterial activity. The diameter of zone of inhibition of each well was recorded. The result of antibacterial activity where tabulated in table- 2.

RESULT

The substance like alkaloids, glycosides, phytosterol, tannins and proteins, saponnin where medicinally active compound of the air potato of Dioscorea bulbifera. From the table-1 it is represented that, the **Acetone** extract confirms the presence of alkaloids, proteins, glycosides, tannins, saponnins.

Benzen extract confirmed the presence of alkaloids, phytosterol, proteins, tannins, saponnins. **Chloroform** extract confirmed the presence of alkaloids, phytosterol, tannins, saponnins. **Petroleum ether** extract confirmed the presence of alkaloids, phytosterols, glycoside, saponnins. **Ethanol** extract confirms the presence of alkaloids, glycoside, saponnins. **Distilled water** extract confirms the presence of alkaloids, phytosterol, proteins, saponnins.

The result of antimicrobial screening of the extracts revealed that the methanolic and ethanolic extract show significant antimicrobial activity than petroleum ether, chloroforms, ethanol and distilled water extract against almost all the test of bacteria and show the zone of inhibition of 13-17mm and 11-14 mm form table 2 respectively. The petroleum ether and chloroforms extracts show the moderate activity and distilled water extracts showed lesser activity against the microorganism. Distilled water extracts did not showed activity against Bacillus subtilis and Pseudomonas aeruginosa.

DISCUSSION

Dioscorea bulbifera, (L.) Kunth. Possess very good store of important bio-active component and emphasis significant scavenging potential. The presence of these bio-active component in the crude drugs have been linked to their activities against disease causing microorganism and also offering the plant themselves protection against infection by pathogenic microorganism (EI-Mahmood et.al.2008).

The obtained result may provide a support to use of the plant in folk and traditional medicine. Based on this, further chemical and pharmacological Investigation to isolate and identify miner chemical constituents in Dioscorea bulbifera to screen other potential bio-activities may be recommended. This type of study will guide the pharmaceutical companies to select the required part of the plant which yield maximum quantity of required active ingredient for the therapeutic preparations.

CONCLUSION

The extract of the plant part produced good inhibition zone against the test organism. So it is expected that they could be used to treat infection and disease caused by these organism and if the active ingredients of the extract are isolated and possibly crystallized, therapeutic, antibiotics could be produced from these compound. The inhibitions of growth of the test organism that are known to cause infection justify the continued use of this plant in traditional system of medical per- posses.

ACKNOWLEDGMENTS

Author are highly thankful to Late. N.P.W. Science College, Lakhani, dist. Bhandara, (M.S.) for providing necessary laboratory. Author are also thankful to my elder brother Dilip Suryabhan Bhaisare to encourage for this work.

REFERENCES

1. EI-Mahmood, A. M., Doughari, J. H. and F. J. Chanji. In vitro antibacterial activities of crud extracts of Nauclea Latifolia and Daniella oliveri. *Scientific Research and Essay*, 2008; 3(3): 102-105.
2. Evans, C.E. Banso, A.and O. A. Samual. Efficacy of some new medicinal plantagainst *Salmonella typhi: an in vitro study. J. Ethnopharmacol.*, 2002; 80: 21-24.
3. Gunasekaran Balamurugan and Shinnaraj Selvarajan. Preliminary phytochemical screening and anthelmentic activity of *Indigofera tinctoria* linn. Int.j.drug dev & res, 2009; 1(1): 157-160.
4. Harborne, J. B., Phytochemical method. London: Chapman and Hall, Ltd, 1996; 52-105.
5. Kokate, C. K. Practical pharmacognosy, 4th ed.Vallabh Prakashan, Delhi, 1994; 115-17: 123, 124, & 127.
6. Kirby, M... Bauer, A. Sherris, C. and M. Turck. Antibiotic susceptibility testing by a standardized single disk method, *Amer, J, Clin, Pathol*, 1966; 45; 493-496.

Off. Principal
Late. N.P.W. College
Lakhani, Distt. Bhandara

Late N. P. W. College, Lakhani
Ref. No.
Dt.
Distt. Bhandara

7. Sofowora, A. Medicinal plant and traditional medicine in Africa. John Wiley and Sons, New York, 1984.
8. Suriyavathana & Indupriya, Screening of antioxidant potential in *Dioscorea bulbifera,* IJPLS, April 2011; 2(4): 661-664.
9. Tropical Plant Database, Ken Fern, tropical. The ferns.info. php=id *Dioscorea bulbifera,* 2018.

Off. Principal
Late. N.P.W. College
Lakhani, Distt. Bhandara

Late N.P.W. College, Lakhani Distt. Bhandara Ref. No. Dt.