Thoothukudi Coast and Antioxidant Activity of Ascidian

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Ascidiansarearichsourceofbioactivesecondarymetabolites.*Phallusianigra*isasimpleascidian belongingtothefamilyAscidiidaefoundinplentythroughouttheyearalongtheThoothukudicoastofIndia. AntioxidantactivitywasperformedbyDPPH(1,1diphenyl-2-picrylhydrazyl)radicalscavengingmethodfor differentextractsof*Phallusianigra*whichshowedthatthealcoholicextractoftheanimalonhigher concentrationpossessbetterantioxidantpotentialwhencomparedtothatofthestandardascorbicacid.They exhibitedstrongantioxidantDPPHradicalscavengingactivitywithabsorbanceof0.1984and0.0553for ascorbicacidandethanolicextractrespectively.Thestrongestantioxidantactivityofethanolextractmaybedue tothepresenceofflavonoidsandphenols.

Keywords:*Phallusianigra*,DPPH,Flavonoids..

1.Introduction

Theoceanisconsideredtobeanuntappedsourceformanythingsincludingpotentialdrugs.Ascidiansare marinesedentaryorganisms.Insomecountries,mainlythoseoftheFarEastandcertainpartsoftheMediterranean, ascidiansareeatenbymanandaresufficientlyimportanttomeritanentryintheF.A.OyearbookofFishery statistics[1].*Microcosmussulcatus*,*Styelaplicata*and*Polycarpapomaria*aretakenasfoodintheMediterranean [2].*Halocynthiaroretzi*inJapan,isevencultured intheNorthofHonsyu[3]forhumanconsumptionand*Pyurachilensis*ispopula rinSouthAmerica[4]asafoodsource.MargalinoandDestefanofoundthatthefleshof *Microcosmussulcatus*isalmostasdigestibleaswholeeggandtheproteincontenthigher[5].Suchistheir abundanceinsomelocalitiesthatascidianshavebeenconsideredasapossiblesourceofcellulose,vanadium, proteinandotherchemicals[6,7].Thoughthenutritivevalueofmanynaturalresourcesoftheseahasgainedmuch attention,theimportanceofascidiansasfoodordrughasbeentotallyneglectedinourcountry.*Phallusianigra*isa simpleascidianbelongingtothefamilyAscidiidaeoccurringasthemajorcomponentoffoulingcommunityonthe hullofships,piers,pilings,harbourinstallationsandmaterialsusedforaquacultureoperationsintheTuticorinPort Area.Previousstudiesshowthattheanimalpossessesantipyretic[8],analgesicanaesthetic[9],anti-inflammatory [10],woundhealing[11]andantimicrobialactivities[12,13].Noreportsareavailableontheantioxidantactivityof differentextractsofthesimpleascidian*Phallusianigra*.Hence,thepresentstudyfocusesonthechemical investigationofantioxidantactivityofthedifferentextractof*Phallusianigra*byDPPHmethod.

TheDPPHassaymethodisbasedonthereductionofDPPH,astablefreeradical[14].Thefreeradical DPPHwithanoddelectrongivesamaximumabsorptionat517nm(purplecolour).WhenAntioxidantsreactwith DPPH,whichisastablefreeradicalbecomespairedoffinthepresenceofahydrogendonor(e.g.,afreeradical scavengingantioxidant)andisreducedtotheDPPHandasconsequencetheabsorbance'sdecreasedfromtheDPPH [15].RadicaltotheDPPH-Hform,resultsindecolourization(yellowcolour)withrespecttothenumberofelectrons captured[16].Morethedecolourizationmoreisthereducingability.Thistesthasbeenthemostacceptedmodelfor evaluatingthefreeradicalscavengingactivityofanynewdrug[17].

2.Materialsandmethods

2.1*Collectionandidentification*

Phallusianigra(Fig.1)wascollectedfromGreenGatearea(8˚48'Nand78˚11'E)ofThoothukudiPort, TamilNadubySCUBAdivingandidentifiedusingKeytoidentificationofIndianascidians[18].Avoucher specimen(AS2083)wasdepositedintheMuseumoftheDepartmentofZoology,A.P.C.MahalaxmiCollegefor Women,Tuticorin628002,Tamilnadu,India.

Fig.1:*Phallusianigra*Sav.

2.2Preparationofextract

Thewholeanimalwasdriedinshadeandhomogenizedtogetacoarsepowder.Thepowderwas successivelyextractedwithvarioussolventssuchaspetroleumether(40^0-60^0C),benzene,chloroform,ethanol, methanolandwater.

2.3DPPHRadicalScavengingAssay

Theantioxidantactivityoftheanimalextractswasmeasuredonthebasisofthescavengingactivityofthe stable1,1-diphenyl2-picrylhydrazyl(DPPH)freeradicalaccordingtothemethoddescribedbyBrand-Williams*et al*[19]withslightmodifications.1mlof0.1mMDPPHsolutioninmethanolwasmixedwith1mlofanimalextract solutionofvaryingconcentrations(50,100,150and200µg/ml).Correspondingblanksamplewerepreparedand L-Ascorbicacidwasusedasreferencestandard.Mixtureof1mlmethanoland1mlDPPHsolutionwasusedas control.Thereactionwascarriedoutintriplicateandthedecreaseinabsorbancewasmeasuredat517nmafter30 minutesindarkusingUV-Visspectrophotometer(UV-VISShimadzu).Theinhibition%wascalculatedusingthe followingformula,Inhibition%=Ac-As/Ac×100

WhereAcistheabsorbanceofthecontrol

Asistheabsorbanceofthesample[20]

3.ResultsandDiscussion

Theresultsofantioxidantactivityofthedifferentextractsatvaryingconcentrationsarepresentedinthe Table1.Theethanolicextractoftheanimalshowedthesignificantantioxidantpotentialwhencomparedtothatof thestandardascorbicacidbyDPPHscavengingassaymethod.

Table1:Absorbanceofdifferentextractof*Phallusianigra*atvaryingconcentration

Concentration (µg/ml)	Petroleumether	Benzene	Chloroform	Ethanol	Methanol	Water			Standard Ascorbicacid
500	.4944	0.5255	0.2124	0.1998	0.1139	0.1122	0.3126		
1000	.4876	0.4879	0.2118	0.0921	0.1059	0.1080	0.2989		
1500	.3922	0.4225	0.1989	0.0726	0.0976	0.0767	0.2126		
2000	.2345	0.4100	0.0976	0.0553	0.0645	0.0621	0.1984		

Absorbance of control at 517 nm 0.3846

Radicalscavengingmethodfordifferentextractsof*Phallusianigra*showedthatthechloroform,ethanol, methanolandaqueousextractoftheanimalonhigherconcentrationpossessbetterantioxidantpotentialwhen comparedtothatofthestandardascorbicacid.Theyexhibitedstrongantioxidant DPPHradicalscavengingactivity withabsorbanceof0.1984and0.0553forascorbicacidandethanolicextractrespectively.Generally,theantioxidant propertiesoftheseextractswerefoundtobeconcentrationdependent.Basedontheresultsobtained,highly significantantioxidantpotentialwasobservedintheethanol,methanolandaqueousextractswhicharemorepolarin DPPHassay[21].Apreliminarychemicalscreeningoftheethanolicextractof*Phallusianigra*showedthepresence

ofalkaloids,terpenoids,flavonoids,glycosides,phenoliccompoundsandtannins[22].Thestrongestantioxidant activityofethanolextractmaybeduetothepresenceofanyofthesechemicalconstituents.

4.Conclusion

Theresultsofthepresentstudysuggestthatthealcoholicandaqueousextractof*Phallusianigra*illustrates highlysignificantantidiabeticactivity,whichmaybeduetothepresenceofflavonoidsandphenols.

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