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Evaluation of antioxidant potential of *Capsicum frutescens*

Maya M R[1], Ramanaiah Illuri[1], Venkatakrishna K[1], Rameshkumar K[2], Veeramanikandan V[3], Eyini M[4], Balaji P[1*]

[1]PG and Research Centre in Biotechnology, MGR College, Hosur, Tamilnadu, India,

[2]PG and Research Department of Zoology, Vivekananda College, Madurai, Tamilnadu, India,

[3]PG and Research Centre in Microbiology, MGR College, Hosur, Tamilnadu, India,

[4]Centre for Research and PG studies in Botany, Thiagarajar College, Madurai, Tamilnadu, India.

ABSTRACT

Capsicum frutescens has been known to contain a high level of antioxidant components. We investigated antioxidant activities in various solvent extracts from *C. frutescens*. The aim of this study is to evaluate *invitro* antioxidant activity of acetone, carbinol, hot water and hexane extracts of *Capsicum frutescens.* Preliminary analysis revealed that all the four extracts responded positively for all the phytoconstituents. Acetone extract showed the strongest phenolic and tannin content; showed highest activity for FRAP, ABTS, Superoxide Radical and Hydroxyl Radical Scavenging Activity. The present study explored that *Capsicum frutescens* has efficient antioxidant activity and could act as safe and cost-effective with potential biological applications.

Keywords: *Capsicum frutescens*, Antioxidant, Free radical scavengers, ABTS, FRAP

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***Address for Correspondence:**

Dr. P. Balaji, PG and Research Centre in Biotechnology, MGR College, Hosur – 635130, Tamilnadu, India

INTRODUCTION

The use of plants as medicines goes back to early man. Certainly the great civilization of ancient Indians, Chinese, and North Africans provided evidence of man's ingenuity in utilizing plants for the treatment of a wide variety of diseases. In ancient Greece, for example, scholars classified plants and gave description of them thus aiding the identification process. Theophrastus has been described as the father of Botany who extolled the virtues of medicinal plants and forecast the possibility of discovering flavonoids. In the 19th century, man began to isolate the active principles of medicinal plants and one particular landmark was the discovery of quinine from the Cinchona bark by the French scientist Caventou and Pelletier. Such discoveries led an interest in plants from the new world and expeditions scoured the almost impenetrable jungles and forests in the quest for new medicines[1]. In developing countries, synthetic antimicrobial drugs are not only expensive and inadequate for the treatment of diseases but also often associated with adulterations and side effects. Natural products are an excellent source of complex chemicals, possessing a wide variety of biological activities and having great potential therapeutic value[2]. More than 50% of prescribed medicines in the well-developed industrialized nations are derived directly or indirectly from plants despite advanced progress in synthetic chemistry[3]. In combating many lifestyle diseases the utilization of various medicinal plant extracts as anti-oxidant, anti-diabetic etc are of great significance. Hence, the present study was initiated with an aim to study the free radical scavenging and antioxidant property of the locally used plant, *Capsicum frutescens.*

MATERIALS AND METHODS

Collection and identification of plant material

The fruits of *Capsicum frutescens* were collected from Thirrsur district of Kerala, India. The type specimen was identified and authenticated by Dr. M. Kumar, Assistant Professor, Department of Plant Biology and Biotechnology, Madras Christian College, Chennai Tamil Nadu India. The collected fruits were cleaned shade dried and powdered for further extraction and analysis.

Preparation of extracts

The whole *Capsicum* fruits were washed using distilled water and cut into small slices and were shade dried. The

dried samples were then blended and extracted with aqueous and organic solvents viz., carbinol, acetone and hexane in soxhlet apparatus for 10 hrs. After complete extraction, the extracts were filtered and concentrated under reduced pressure by using rotary vacuum evaporator. The extracts were dried in vacuum dryer and stored at room temperature until used.

Determination of Non-Enzymatic Antioxidants

Total Phenolics and Tannins

The total phenolic content of the extracts were determined according to the method described by Siddhuraju and Becker[4]. Known concentration of each extract was taken in test tubes and made up to the volume of 1 ml with distilled water. Then 0.5 ml of Folin-ciocalteu phenol reagent (1:1 with water) and 2.5 ml of sodium carbonate solution (20%) were added sequentially in each tube. Soon after vortexing the reaction mixture, the test tubes were placed in dark for 40 min and the absorbance was recorded at 725 nm against the reagent blank. The analysis was performed in triplicate and the results were expressed as the Tannic acid equivalents (TAE). Using the same extract, the tannins were estimated after treatment with polyvinyl polypyrrolidine (PVPP). One hundred milligrams of PVPP was weighed in to a 100 × 12 mm test tube and to this 1.0 ml of distilled water and then 1.0 ml of tannin containing phenolic extract were added. The content was vortexed and incubated at 4ºC for 4 h. Then the sample was centrifuged (3000xg for 10 min at room temperature) and the supernatant was collected. This supernatant has only simple phenolics other than tannins (the tannins would have been precipitated along with the PVPP). The phenolic content of the supernatant was measured as mentioned above and expressed as the content of non-tannin phenolics. From the above results, the tannin content of the sample was calculated as the difference between total phenolics and non-tannin phenolics.

Tannin (%) = Total phenolics (%) – Non-tannin phenolics (%)

Total Flavonoids

The flavonoid content of the sample extracts was determined by the use of a slightly modified colorimetric method described previously Zhishen *et al.*[5]. A 0.5 ml extract was mixed with 2 ml of distilled water and subsequently with 0.15 ml of 5% NaNO2 solution. After 6 min, 0.15 ml of 10% AlCl3 was added and allowed to stand for 6 min, then 2 ml of 4% NaOH solution was added to the mixture. Immediately distilled water was added to bring the final volume to 5 ml, and then the mixture was thoroughly mixed and allowed to stand for another 15 min. Absorbance of the mixture was determined at 510 nm versus prepared water blank. Rutin was used as the standard compound for the quantification of total flavonoids. All the values were expressed as milligram of rutin equivalents (RE) per gram of extract.

In-vitro Antioxidants studies

Ferric Reducing Antioxidant Power (Frap) Assay

The antioxidant potential of various fruit extracts of *C. frutescens* was estimated from their ability to reduce TPTZ–Fe(III) complex to TPTZ–Fe(II) complex and the results are expressed as concentration of substance having ferric-TPTZ reducing ability equivalent that of 1 mM concentration of Fe(II). The antioxidant capacity of fruit extracts of *C. frutescens* was estimated according to the procedure described by Pulido *et al.*[6]. FRAP reagent (900 µL), prepared freshly and incubated at 37ºC, was mixed with 90 Ml of distilled water and 30 µL of extracts of *C. frutescens* or methanol (for the reagent blank). The fruit extracts of C. *frutescens* and reagent blank were incubated at 37◦C for 30 min in a water bath. The final dilution of fruit extracts of *C. frutescens* in the reaction mixture was 1/34. The FRAP reagent contained 2.5 mL of 20 mM TPTZ solution in 40 mM HCl, 2.5 mL of 20 mM FeCl3.6H2O and 25 mL of 0.3 M acetate buffer (pH 3.6) as described by (Siddhuraju and Becker 2003). At the end of incubation the absorbance readings were taken immediately at 593 nm, using a spectrophotometer. Methanolic solutions of known Fe (II) concentration, ranging from 100 to 2000 µM (FeSO4.7H2O) were used for the preparation of the calibration curve. The FRAP value is expressed as µmol Fe (II) equivalent/g extract.

Antioxidant activity by ABTS•+ assay

The total antioxidant activity of the fruit extracts of *C. frutescens* was measured by ABTS radical cation decolorization assay according to the method of Re *et al.*[7]. ABTS•+ was produced by reacting 7 mM ABTS aqueous solution with 2.4 mM potassium persulfate in the dark for 12-16 h at room temperature. Prior to assay, this solution was diluted in ethanol (about 1:89, v/v) and equilibrated at 30ºC to give an absorbance of 0.700±0.02 at 734 nm. The stock solution of the fruit extracts of *C. frutescens* were diluted such that after introduction of 10 µl aliquots into the assay, they produced between 20% and 80% inhibition of the blank absorbance. After the addition of 1 ml of diluted ABTS solution to 10 µl of fruit extracts of *C. frutescens* or Trolox standards (final concentration 0-15 µM) in ethanol, absorbance was measured at 30ºC exactly 30 min after the initial mixing. Appropriate solvent blanks were also run in each assay. Triplicate determinations were made at each dilution of the standard, and the percentage inhibition was calculated of the blank absorbance at 734 nm and then was plotted as a function of Trolox concentration. The unit of Trolox equivalent antioxidant capacity (TEAC) is defined as the concentration of Trolox having equivalent antioxidant activity expressed as µM/g sample extract on dry matter.

Phosphomolybdenum Assay

The antioxidant activity of fruit extracts of *C. frutescens* was evaluated by the green phosphomolybdenum complex formation according to the method of Prieto *et al.*[8]. A 100 µL of fruit extracts of *C. frutescens* solution (in 1 mM dimethyl sulphoxide) was combined with 1 mL of reagent solution (0.6 M sulphuric acid, 28 mM sodium phosphate and 4 mM ammonium molybdate) in a vial.

The vials were capped and incubated in a water bath at 95◦C for 90 min. After the fruit extracts of *C. frutescens had* cooled to room temperature, the absorbance of the mixture was measured at 695 nm against a blank. The results reported (Ascorbic acid equivalent antioxidant activity) are mean values expressed as grams of ascorbic acid equivalents/100 g extract activity) are mean values expressed as grams of ascorbic acid equivalents/100 g extract.

Superoxide radical (O2 •−) scavenging activity

The assay was based on the capacity of the extracts to inhibit formazan formation by scavenging the O2 •− generated in riboflavin-light-nitroblue tertrazolium (NBT) system[9]. Each 3 ml reaction mixture contained 50 mM sodium phosphate buffer (pH 7.6), 20 µg riboflavin, 12 mM EDTA, 0.1 mg NBT and 1 ml of fruit extracts of *C. frutescens* solution (50-250 µg/ml). Reaction was started by illuminating the reaction mixture with different concentrations of fruit extracts of *C. frutescens* for 90 sec immediately after illumination the

absorbance was measured at 590 nm. Identical tubes with reaction mixture kept in dark served as blanks. The percentage inhibition of superoxide anion generation was calculated using the following formula: % of inhibition = [(A0 – A1)/A0] × 100 where, A0 is the absorbance of the control, and A1 the absorbance of the extract/standard. The results were compared with the commercial available antioxidants such as Rutin and BHT.

Hydrogen peroxide scavenging activity

The ability of the extracts to scavenge hydrogen peroxide was determined according to the method of Ruch *et al.*[10]. A solution of hydrogen peroxide (2 mmol/l) was prepared in phosphate buffer (0.2 M, pH 7.4). Hydrogen peroxide concentration was determined spectrophotometrically from absorption at 230 nm with molar absorbtivity 81 $(mol/l)^{-1}$ /cm. Extracts (10 µl) were added to 3.4 ml of phosphate buffer together with hydrogen peroxide solution (0.6 ml). Absorbance of hydrogen peroxide at 230 nm was determined after 10 min against a blank solution containing phosphate buffer without hydrogen peroxide. The percentage inhibition activity was calculated from $[(A_0 - A_1)/A_0]$ X100, where A_0 is the absorbance of the control (reaction mixture without extract) and A_1 is the absorbance of the extract/standard.

Hydroxyl radical scavenging activity

The scavenging activity of the extracts was measured according to the method of Klein *et al.*[11]. Various concentrations (20, 40, 60 and 80 µg) of extracts were added with 1.0 ml of iron-EDTA solution (0.13% ferrous ammonium sulfate and 0.26% EDTA), 0.5 ml of EDTA solution (0.018%), and 1.0 ml of dimethyl sulphoxide (DMSO) (0.85% v/v in 0.1 M phosphate buffer, pH 7.4). The reaction was initiated by adding 0.5 ml of ascorbic acid (0.22%) and incubated at 80–90 ^oC for 15 min in a water bath. After incubation the reaction was terminated by the addition of 1.0 ml of ice-cold TCA (17.5% w/v). Three milliliters of Nash reagent (75.0 g of ammonium acetate, 3.0 ml of glacial acetic acid, and 2 ml of acetyl acetone were mixed and raised to 1L with distilled water) was added and left at room temperature for 15 min. The reaction mixture without sample was used as control. The intensity of the color formed was measured spectroscopically at 412 nm against reagent blank. The % hydroxyl radical scavenging activity (HRSA) is calculated by the following formula:

% HRSA = from $[(A_0 - A_1)/A_0]$ X100, where A_0 is the absorbance of the control and A_1 is the absorbance of the extract/standard.

Assay of nitric oxide scavenging activity

The procedure is based on the method, where sodium nitroprusside in aqueous solution at physiological pH, spontaneously generates nitric oxide, which interacts with oxygen to produce nitrite ions that can be estimated using Greiss reagent. Scavengers of nitric oxide compete with oxygen leading to reduced production of nitrite ions. For the experiment, sodium nitroprusside (10 mM) in phosphate buffered saline (0.2 M, pH 7.4) was mixed with 100 µl sample solution of various extracts and incubated at room temperature for 150 min. The same reaction mixture without the sample was used as the control after the incubation period, 0.5 ml of Griess reagent (1% sulfanilamide, 2% H_3PO_4 and 0.1% N-(1- naphthyl) ethylenediaminedihydrochloride) was added. The absorbance of the chromophore formed was read at 546 nm[12].

RESULT AND DISCUSSION

Determination of total phenolic content in fruit extracts of Capsicum frutescens

Total phenolic content of fruit extracts of *C. frutescens* were shown in Table 1. Among the different extracts analyzed, hot water extract has recorded the highest phenolic content with the value of 207.33mg TAE/1g extract. However, it was followed by acetone extract (207.33mg TAE/1g extract) and carbinol extracts (198.4866 mg TAE/1g extract) and hexane extracts(175.55mg TAE/1g).

Table 1: Total phenolic content in fruits of *Capsicum frutescens*

Concentration Of The Sample(µg/ml)	Hot Water Extracts mg TAE/1g	Carbinol Extracts TAE/1g	Acetone Extracts mg TAE/1g	Hexane Extracts mg TAE/1g
10	45.28	62.39	27.93	12.57
20	82.53	79.51	112.10	13.38
30	114.9	95.92	131.66	29.45
40	136.43	112.10	166.82	35.73
50	159.83	130.61	195.22	43.65
60	178.46	155.18	198.71	70.19
70	186.26	166.23	201.62	92.89
80	192.89	177.99	204.88	114.90
90	202.09	195.22	206.98	159.83
100	203.25	198.48	207.33	175.55

TAE: Tannic acid equivalents. Values are means of three independent analysis ± SEM (n=3).

Determination of total tannin content in fruit extracts of *C. frutescens*

The tannin content analysis was performed in triplicate and the results were expressed as the Tannic acid equivalents . The acetone fruit extract of *C. frutescens* was found to contain highest tannin content of 391.51mg TAE/1g at 100µg concentration followed by hot water extract. It was found to be 58.001 mg TAE/g at 100µg concentration and hexane extracts of *C. frutescens* at 100µg concentration was found to contain 234.98mg TAE/1g.

Table 2: Total tannin contents in fruit of *Capsicum frutescens*

Concentration of the sample(µg/ml)	Hot water extracts mg TAE/1g	Carbinol extracts mg TAE/1g	Acetone extract mg TAE/1g	hexane extracts mg TAE/1g
10	4.75	46.55	25.23	109.39
20	12.39	53.41	53.78	153.66
30	15.75	74.77	79.89	170.19
40	27.10	76.06	80.57	186.98
50	39.57	101.19	131.94	190.49
60	41.70	140.03	160.81	195.65
70	46.33	200.23	231.31	213.46
80	56.22	242.81	274.87	224.98
90	57.00	266.04	358.91	231.18
100	58.00	309.60	391.51	234.98

TAE: Tannic acid equivalents. Values are means of three independent analysis ± SEM (n=3).

Determination of total flavonoids content in fruit extracts of *C. frutescens*

The estimation of total flavonoid contents of the fruit extracts of *C. frutescens* carried during this experiment are shown in Table 3 and it was observed that all the extracts contain total flavonoid content. Hexane extract was found to contain maximum total flavonoid content with 1.52641 mg RE/1g extract, followed by acetone (1.23519mg RE/1g extract) , hot water extract (0.335409mg RE/1g extract) and methanol (0.309299 RE/1g)

Table 3: Total flavonoids contents in fruit extracts of *Capsicum frutescens*

Concentration of the sample(µg/ml)	Hot water extracts mg RE/1g	Carbinol extracts mg RE/1g	Acetone extract mg RE/1g	Hexane extracts mg RE/1g
10	0.04	0.02	0.11	0.09
20	0.11	0.03	0.35	0.13
30	0.15	0.11	0.43	0.17
40	0.17	0.13	0.49	0.26
50	0.20	0.14	0.64	0.31
60	0.23	0.16	0.89	0.46
70	0.25	0.17	0.94	0.72
80	0.26	0.19	1.03	0.88
90	0.28	0.29	1.06	1.34
100	0.33	0.30	1.23	1.52

RE: Rutin equivalents. Values are means of three independent analysis ± SEM (n=3).

***In vitro* antioxidant studies**

Ferric Reducing Antioxidant Power (FRAP) assay in fruit extracts of C. frutescens

The ferric reducing antioxidant power (FRAP) assay is a simple and widely used method to evaluate the antioxidant capacity of plant extracts. The ability of fruit extracts of *C. frutescens* to reduce ferric (III) ions to ferrous (II) ions was determined in FRAP (Ferric reducing antioxidant power) is given Table 4.

During the Ferric reducing antioxidant power (FRAP) assay of hot water, acetone and hexane extracts, acetone extract showed higher FRAP activity of 44.80231 mmol Fe (II) E / mg extract followed by methanol extract which recorded 29.79939mmol Fe (II) E / mg extract and hot water extract (25.46368 mmol Fe (II) E / mg extract)and hexane (11.18337). The absorbance readings were taken immediately at 595 nm, using a spectrophotometer. The parameter equivalent concentration was calculated as the concentration of antioxidant giving an absorbance increase in the FRAP assay equivalent to theoretical absorbance value of a 1 mM/L concentration of Fe (II) solution. The results were compared with the commercial available antioxidants such as BHT and Rutin.

Table 4: Ferric Reducing Antioxidant power assay in fruit extracts of *C. frutescens*

Concentration of the sample(µg/ml)	Hot water extracts (mmol Fe (II) E/mg extracts)	Acetone extracts (mmol Fe (II) Fe/mg extracts)	Carbinol extracts (mmol Fe (II) E/mg extracts)	Hexane extracts (mmol Fe (II) Fe/mg extracts)
10	16.41	22.74	27.78	7.26
20	16.58	23.26	27.80	8.08
30	16.99	28.01	27.80	8.94
40	18.09	31.79	28.18	9.25
50	19.16	39.98	28.50	9.60
60	21.81	41.46	28.52	9.70
70	22.16	41.91	28.52	10.25
80	22.81	42.35	29.18	10.49
90	23.08	44.01	29.78	11.01
100	25.46	44.80	29.79	11.18

BHT: 91.81±2.15; Rutin: 216.59±2.59E: Fe (II) equivalents. Values are means of three independent analysis ± SEM (n=3).

ABTS$^{\bullet+}$ scavenging activity in fruit extracts of C.frutescens

The ABTS•+ assay is a colorimetric analysis in which ABTS radical cation decolorizes in the presence of antioxidant compounds. The capacity of ABTS$^{\bullet+}$ scavenging activity of fruit extracts of *C. frutescens* tested . The results obtained clearly imply that all fruits extracts of *C. frutescens* inhibitor scavenge ABTS radical cation. Among the extracts of *C. frutescens acetone* extract showed the highest scavenging activity of 4947.72 µM TEAC/g extract followed by hexane extract (3671.97 µM TEAC/g extract) and carbinol extract (2915.98 µM TEAC/g extract) and hot water (2868.73 µM TEAC/g extract) Triplicate determination was made at each dilution of the standard, and the percentage inhibition was calculated of the blank absorbance at 734nm and then was plotted as a function of Trolox equivalent antioxidant capacity. The results were compared with the commercial available antioxidants such as BHT and Rutin.

Table 5: ABTS·+ scavenging activity in fruit extracts of *C. frutescens*

Concentration of the sample(µg/ml)	Hot water extracts (µM TEAC/g extract)	Carbinol extraxts (µM TEAC/g extract)	Acetone extracts (µM TEAC/g extract)	Hexane extracts (µM TEAC/g extract)
10	2868.73	2915.98	4947.72	3671.97

BHT: 12454.2 ±126.7; Rutin 11096.8±162.1. TEAC: Trolox equivalent Antioxidant capacity. Values are means of three independent analysis ±SEM (n=3).

Phosphomolybdenum assay in fruit extracts of C. frutescens

The reducing ability of extracts of *C. frutescens* expressed in terms of ascorbic acid equivalents are presented in Table 6. All the extracts of *C. frutescens* tested in the present study recorded significant antioxidant activity. Among the different extracts, hexane extract has recorded the highest total antioxidant capacity of 100 mg AAE/mg of fruit extract followed by hot water extract (35.235AAE/mg of plant extract) and acetone extract (25.825AAE/mg of plant extract) and methanol(22.351) and hexane(13.1513) The results were compared with the commercial available antioxidants such as BHT and Rutin.

Table 6: Phosphomolybdenum activity in extracts of *C. frutescens*

Concentration of the sample(µg/ml)	Hot water extracts (mgAAE/1g)	Carbinol extracts (mgAAE/1g)	Acetone extracts (mgAAE/1g)	Hexane extracts (mgAAE/1g)
10	16.26	13.03	7.23	2.86
20	27.82	15.06	12.50	3.39
30	29.79	15.48	12.12	5.63
40	33.68	15.49	13.34	6.27
50	34.33	17.29	21.26	7.00
60	33.38	18.45	22.86	8.16
70	34.54	21.43	23.85	8.36
80	34.96	22.19	24.12	10.82
90	34.98	22.59	25.71	11.87
100	35.23	22.35	25.82	13.15

BHT: 90.37±1.15; Rutin 61.18±1.90; AAE: Ascorbic Acid equivalent. Values are means of three independent analysis ±SEM (n=3).

Superoxide radical scavenging activity in fruit extracts of C. frutescens

Superoxide is a reactive oxygen species, which can cause damage to the cells and DNA leading to various diseases. It is known to be very harmful to cellular components as a precursor for several reactive oxygen species, contributing to various pathological disorders. The scavenging capacity of superoxide radicals by the extracts of *C. frutescens* shown in Table 7. The extracts of *C. frutescens* showed significant superoxide radical-scavenging activities. Among the different extracts the highest superoxide radical scavenging activity was found in acetone extract with 92.46% followed by hot water extract which showed the superoxide radical scavenging activity of 91.45% and methanol extract with 87.43% and hexane 60.30%.

Table 7: Superoxide radical scavenging activity in extracts of *C. frutescens*

Concentration of the sample(µg/mg)	Hot water extracts mg RE/1g	Carbinol extracts mg RE/1g	Acetone extracts mg RE/1g	Hexane extracts mg RE/1g
10	70.85	70.35	77.38	3.51
20	73.86	74.37	78.39	8.54
30	74.37	78.39	81.40	17.08
40	79.39	80.90	81.90	18.59
50	83.91	82.41	82.41	20.10
60	85.92	84.42	86.43	35.17
70	88.94	85.92	87.93	37.18
80	89.44	85.92	88.94	52.26
90	90.95	86.43	90.95	57.28
100	91.45	87.43	92.46	60.30

BHT: 42.18±41; Rutin: 39.65±2.08.

Hydrogen peroxide scavenging activity

The ability of the extracts to scavenge hydrogen peroxide was determined according to the method of Ruchet al. (1989). Among the different extracts the highest Hydrogen peroxide radical scavenging activity was found in methanol extract with 96.37% followed by hot water extract which showed the superoxide radical scavenging activity of 96.18% and hexane extract with 95.93% and acetone 95.61%.

Table 8: Hydrogen peroxide scavenging activity in fruit of *C. frutescens*

Concentration of the sample(µg/ml)	Hot water Extracts (%)	Carbinol extracts (%)	Acetone Extract (%)	Hexane Extracts (%)
100	96.18	96.37	95.61	95.93

Values are means independent analysis ± SEM (n=3).

Hydroxyl radical scavenging activity

The scavenging activity of the extracts was measured according to the method of Klein et al. (1991). Among the extracts the highest Hydroxyl scavenging activity was found in methanol extract with 100% followed by acetone extract which showed the scavenging activity of 90.55% and hexane extract with 86.544% and hot water 60.30%.

Table 9: Hydroxyl scavenging activity in fruit extracts of *C. frutescens*

Concentration of the sample(µg/ml)	Hot water extracts (%)	Carbinol extracts (%)	Acetone extract (%)	Hexane extracts (%)
10	56.56	74.40	24.27	66.08
20	56.63	75.46	28.53	81.78
30	64.76	75.53	30.53	83.54
40	66.70	76.09	53.12	84.04
50	68.20	76.28	53.12	84.04
60	72.27	78.78	64.32	84.91
70	78.72	80.22	68.27	85.35
80	81.78	80.22	74.21	87.98
90	81.78	84.16	84.66	88.42
100	83.72	86.54	90.55	100

Values are means independent analysis ± SEM (n=3).

Assay of nitric oxide scavenging activity

Among the different extracts the highest nitric oxide scavenging activity was found in carbinol extract with 98.68% followed by acetone extract which showed the scavenging activity of 93.42%; hot water extract with 88.79% and hexane with 84.27%.

Table 10: Nitric oxide scavenging activity in fruit extracts of *C. frutescens*

Concentration of the sample(µg/ml)	Hot water extracts (%)	Carbinol extracts (%)	Acetone extract (%)	Hexane extracts (%)
10	42.73	47.62	34.47	36.65
20	48.74	49.26	38.29	42.36
30	55.12	57.80	39.73	46.67
40	58.88	58.18	55.25	52.70
50	65.07	62.31	58.32	56.02
60	69.71	65.37	61.82	62.72
70	74.15	67.70	68.39	67.27
80	78.78	78.49	78.03	71.78
90	82.72	86.62	79.28	78.12
100	88.79	98.68	93.42	84.27

Values are means independent analysis ± SEM (n=3).

CONCLUSION

The different diseases and various ailments are treated with different medicinal plant extracts is one of the old practice people have adopted[13, 14]. Indigenous communities, otherwise known as tribal people, aboriginal people, or original inhabitants exist in many countries of the world and have their own traditional medicinal practitioners, who rely on a holistic approach for treatment of ailments involving plant, animal or insect parts together with amulets and incantations. *Capsicum frutescens* taken for the present study revealed that the extracts are good source of antioxidants. Meanwhile all the extracts showed effective antioxidant activities among which the acetone and carbinol extract of *Capsicum frutescens* showed high significant antioxidant activity. This study demonstrated that the extracts of *Capsicum frutescens* act as a modern medicine for free radical scavengers.

Conflicts of Interest: Nil

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