

## Antioxidant activity in selected fresh Fruits

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**Abstract - Fruits are rich in antioxidants which help in lowering incidence of degenerative diseases such as cancer, arthritis, heart disease, inflammation and acceleration of the ageing process. It is very important point to move to conventional fruits because the fruits which are highlighted as good antioxidant sources are very expensive. This study was carried out to determine the antioxidant activity (AC) in the formulation which was proposed by Brand Williams, and it is based on the inhibition of the free radical 2, 2-diphenyl-1-picrilhydrazil (DPPH) in ethanol extract of the samples. According to the results water melon (*Citrullus lanatus*) got the highest EC50 value (16.381± 0.698mg/ml) while star fruit (*Averrhoa carambola*), got the lowest EC50 value (0.073± 0.011mg/ml) among these selected fruits. It means that water melon (*C. lanatus*) has the lowest antioxidant activity while star fruit (*A. carambola*) has the highest antioxidant activity among these selected fruits. None of the samples showed more or less similar EC50 for standard L-Ascorbic acid (0.005±0.001mg/mL). Among these selected vegetables, star fruit (*A. carambola*) and bilin (*Averrhoa bilimbi*) are not significantly different from standard sample that was L-Ascorbic acid. Except these two fruits, all the other selected fruit samples significantly differ from L-Ascorbic acid. avocado (*Persea americana*) significantly differs from the other fruit samples. So, that EC50 value is reducing significantly ( $p < 0.05$ ) as water melon (*C. lanatus*) 16.381± 0.698mg/mL > banana (*Musa*) 4.308± 0.265mg/mL > papaya (*Carica papaya*) 4.290±0.388mg/mL > pineapple (*Ananas comosus*) 1.942±0.052mg/mL > egg fruit (*Pouteria campechiana*) 1.712±0.030mg/mL > mango (*Mangifera indica*) 1.180±0.128mg/mL > duriyan (*Durio* sp.) 1.157±0.112mg/mL > avacado (*Persea americana*) 0.795±0.083mg/mL > bilin (*A. bilimbi*) 0.095±0.011mg/mL > star fruit (*A. carambola*) 0.073±0.011mg/mL. Conversely DPPH antioxidant activity increased significantly in ascending order. Considering these results, the local fruits also contain high antioxidant activities.**

**Key words: Antioxidants, DPPH method, EC50 value, Fruits, Radicals**

### INTRODUCTION

Normally fruits and vegetables have many phytochemicals which possess various bioactivities. It includes antioxidants and anticancer constituents. While some fruits and vegetables unable to show high antioxidant activity, most fruits and vegetable show the high antioxidant activity as well as anti-cancer property. Through our diet, we can open ourselves to more antioxidants that is extremely easiest and best way. By consuming fruits and vegetables, we can reduce the risk

of oxidative damages to cells. (Sun et al., 2002). Fruits and vegetables are very good sources of natural antioxidants which consist of many different antioxidant components. (Justina et al., 2013). Hence those are alluded to as “super foods” or “functional foods”(Megan, 2015) These antioxidants are carotenoids, vitamins, phenolic compounds, flavonoids, dietary glutathione and endogenous metabolites (Justina et al., 2013) Thus according to the previous researches it has been highly recommended to include proper combination of fruits in your daily diet, whose phytochemicals synergistically act to reduce the risk of degenerative diseases like cardiovascular disease, cancer etc. (Deepa et al., 2015)

Recent studies have shown that the importance of fruits in a healthy diet and to prevent degenerative diseases that is caused by oxidative stress. (Sreeramulu et al., 2010) For these effects, Vitamins and phytochemicals, such as ascorbic acid, carotenoids, polyphenols, and fiber have been regarded as the bioactive substances responsible. (Szeto et al., 2004)

**Materials and Methods**

Banana (*Musa*), Bilin (*Averrhoa bilimbi*), Avacado (*Persea americana*), Star fruit (*Averrhoa carambola*), Papaya (*Carica papaya*), Mango (*Mangifera indica*), Pineapple (*Ananas comosus*), Egg fruit (*Pouteria campechiana*), Water melon (*Citrullus lanatus*) and Duriyan (*Durio* sp.) were purchased from home gardens and from local farmers in Matale.

The procedure was carried out to determine the antioxidant activity (AC) in the formulation which was proposed by Brand Williams et al. (1995), and it is based on the inhibition of the free radical 2, 2-diphenyl-1-picrilhydrazil (DPPH) in ethanol extract of the samples. Here a modified version was applied following recommendations by Molyneux (2004). To evaluate the antioxidant activity in fresh fruit samples, each sample was taken directly after pretreatments. To evaluate the antioxidant activity, 2 grams from each sample were taken and ground by using motor and pestle. Then after adding 10ml of ethanol (96%) it was allowed to stir for 40 minutes at room temperature and then centrifuged for 10 minutes at 10,000\**g* (13000rpm) to retain the supernatant.

The volume of the extract ranged from 0 to 100 Micro liters and mixed in test tubes, with 2ml of an ethanolic solution of DPPH 40ppm, prepared on the same day at dark conditions. Then ethanol was added to that until the final volume became 3ml. After 30minute incubation in dark at room temperature the absorbance was taken at 517nm by using a spectrophotometer.

The percentage of inhibition is calculated by using the following equation for each extract.

Percentage scavenging activity =  $\frac{\text{Absorbance of the control} - \text{Absorbance of the sample}}{\text{Absorbance of the control}} * 100$

After plotting the graph (concentration of DPPH solution Vs. Percentage scavenging activity), the EC50 values of each sample were determined and antioxidant activity is expressed as mg/ml. Ascorbic acid was taken to draw a standard curve to compare the results, instead of fruit samples.

#### Results and Discussion

According to the results water melon (*Citrullus lanatus*) has the highest EC50 value (16.381±0.698mg/ml) while star fruit (*Averrhoa carambola*), has the lowest EC50 value. (0.073±0.011mg/ml) among these selected fruits. It means that water melon (*C. lanatus*) has the lowest antioxidant activity while star fruit (*A. carambola*) has the highest antioxidant activity among these selected fruits. Because water melon (*C. lanatus*) has required high concentration of the extract to require 50% scavenging of radicals under experimental conditions that have been used, while star fruit (*A. carambola*) required low concentration of the extract to require 50% scavenging of radicals under experimental conditions that have been used. Though star fruit (*A. carambola*) has the lowest EC50 value (0.073±0.011mg/ml) among these selected vegetables, that EC50 value is lower than the standard sample that was L-Ascorbic acid. (0.005±0.001mg/mL) None of the samples showed more or less similar EC50 for standard L-Ascorbic acid. Among these selected vegetables, star fruit (*A. carambola*) and bilin (*Averrhoa bilimbi*) are not significantly different from standard sample that was L-n Ascorbic acid. Except these two fruits, all other selected fruit samples are significantly different from L-Ascorbic acid. avocado (*Persea americana*) is significantly different from other fruit samples.

So, that EC50 value is reducing significantly ( $p < 0.05$ ) as water melon (*C. lanatus*) 16.381±0.698mg/mL > banana (*Musa*)

4.308±0.265mg/mL > papaya (*Carica papaya*) 4.290±0.388mg/mL > pineapple (*Ananas comosus*) 1.942±0.052mg/mL > egg fruit (*Pouteria campechiana*) 1.712±0.030mg/mL > mango (*Mangifera indica*) 1.180±0.128mg/mL > duriyan (*Durio* sp.) 1.157±0.112mg/mL > avacado (*Persea americana*) 0.795±0.083mg/mL > bilin (*A. bilimbi*) 0.095±0.011mg/mL > star fruit (*A. carambola*) 0.073±0.011mg/mL. Conversely DPPH antioxidant activity increased significantly in ascending order.

#### Conclusion

The local fruits also contain high antioxidant activities. Considering these results, we can increase our nutritional levels in our diet by the fruits that could be grown in our home gardens.

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