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PFP 26

TOTAL PHENOL CONTENT AND ANTIOXIDANT ACTIVITY OF DIFFERENT VARIETIES OF *ANANAS COMOSUS* (L.) MERR.

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INTRODUCTION

Pineapple, *Ananas comosus* (L.) Merr., belongs to the family Bromeliaceae is one of the most appreciated fruit from tropical and sub tropical area. Its fruit is consumed

amount of carbohydrate (reducing sugar), protein, phenol, chlorophyll and carotenoid [Sadasivam and Manickam, 1992].

RESULTS AND DISCUSSION

The yield of oil was 2%. Saponification value of the oil was 189.56 i.e. 189.56mg of KOH is required to saponify 1g of the oil completely. This value is the measure of KOH needed to add to manufacture soap from the oil, so that the soap is neither alkaline nor oily. The acid value of the oil was 0.28 i.e. 0.28mg of KOH is needed to neutralize the free fatty acids present in 1g of the oil. This value is comparatively less than that of other vegetable oils indicating high shelf life of the oil. From the study, seven compounds viz., phenols, flavonoids, carbohydrates, terpenoids, cardiac glycosides, carotenoids and anthocyanidins were present while steroids, phlobatannins, tannins, saponins, alkaloids and anthraquinones were absent. The presence of two flavonoids at Rf values 0.19 and 0.36 and four anthocyanidins viz., delphinidin, petunidin, malvidin and hirsutidin were confirmed in the flower (Plate 2). The absence of alkaloids were confirmed by paper chromatography and thin layer chromatography. The amount of reducing sugar was 0.8775mg/g tissue, which is almost half of that in pulses where it is approximately 2mg /g tissue i.e. double amount of plant is needed to meet the carbohydrate source when compared to pulses. The protein content was 4.761 µg/mg tissue, which is almost 7 times less than in pulses which is approximately 28 µg / mg tissue. So the plant is not a good source of protein. The phenol content was 187.2 mg/g tissue, which is almost thrice the amount in terrestrial plants. That is its stress tolerance is three times more than common terrestrial plants such as neem, *Centella*, *Ocimum* etc. The total chlorophyll and carotenoids were 2.492mg/g tissue and 0.109 mg/g tissue respectively.

The qualitative analysis of *Eichhornia crassipes* [Kurup and co-workers, 2013] showed the presence of tannin, phlobatannin, steroids, terpenoids, alkaloids, flavonoids, phenolic contents, quinone, anthraquinone and cardiac glycosides. But this study showed the absence of steroids, phlobatannin, tannin, alkaloids and anthraquinones while terpenoids, flavonoids, phenols and cardiac glycosides were

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cultivar 'MD2' (57.2 μ g/ml) and highest IC₅₀ value for cultivar 'Kew' (237.74 μ g/ml). The IC₅₀ value for the standard antioxidant was 16.83 μ g/ml. The IC₅₀ values of the fruit extracts of different cultivars indicates the highest free radical scavenging activity of cultivar 'MD2' than the other cultivars studied. The free radical scavenging activity of pineapple fruit extracts and pineapple phenolics were reported by, Hossain and Rehman (2011) and Haripyaree *et al.*, (2010) respectively.

Reducing power assay: Various concentrations (50-250 μ g/ml) of fruit extracts of different cultivars of pineapple possessed significant reducing power. The fruit extracts of all cultivars exhibited a dose dependent increase in reducing power. It was observed that the fruit extract of cultivar MD2 had higher reducing power in all the concentrations used. It was observed that the reducing power of the extracts of all cultivars increased with increase in their concentration. In reducing power assay, the antioxidants present in the sample can reduce the Fe³⁺ to Fe²⁺ by donating an electron. Increase in absorbance at 700nm indicates the increase in reductive ability (Kalaiselvi *et al.*, 2012).

Nitric oxide radical scavenging activity: All pineapple varieties showed potent nitric oxide scavenging activity. In this assay also the lowest IC₅₀ value was noticed in cultivar 'MD2' (18.3 μ g/ml) and highest IC₅₀ value for cultivar 'Kew' (168 μ g/ml). The IC₅₀ value noticed in the standard Ascorbic acid was 13.39 μ g/ml. Excess concentration of nitric oxide results in cytotoxic effects such as cancer, Alzheimer's, AIDS and arthritis. This is due to the fact that oxygen react with excess nitric oxide to form nitrite and peroxy nitrite anion, which act as free radicals (Ranka and Karthik, 2017).

Hydroxyl radical scavenging activity: Here all the pineapple fruit extracts showed a good amount of hydroxyl radical scavenging activity. The lowest IC₅₀ value was showed by cultivar MD2 (83.61 μ g/ml). The IC₅₀ value for the standard Ascorbic acid was 47.58 μ g/ml. The IC₅₀ values indicates that the pineapple fruit extracts are better hydroxyl scavengers. Hydroxyl radicals are formed by the Fenton reaction in the presence of Fe²⁺ and H₂O₂, which is known to be the most reactive of all the reduced forms of di-oxygen, capable of damaging almost every molecules found in living cells. Deoxyribose was oxidised when exposed to hydroxyl radicals generated by Fenton reagent and the oxidation degradation can be detected by heating the products with TBA and measuring the absorbance at 532nm .

In the present study it was observed that the pineapple fruit extracts contains substantial quantity of phenolics. This phenol content is responsible for the antioxidant activity of pineapple fruit extract in different *in vitro* assays.

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