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In vitro ANTIOXIDANT PROPERTIES OF SRI LANKAN FINGER MILLET (*Eleusine coracana*) VARIETIES

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ABSTRACT

Free radicals (FR) are generated and neutralized through various mechanisms in living organisms. If the generation of FR exceeds its neutralization process, it causes 'oxidative stress' leading to many non-communicable diseases. Antioxidants are capable of quenching FR and preventing their formation. Finger millet varieties (FMV) are reported to have naturally occurring antioxidants. However, there is a lack of scientific evidences on potential health benefits of Sri Lankan FMV. The objective of the present study was to evaluate antioxidant properties (AP) of locally grown FMV. Flours of whole grains of Sri Lankan FMV, Ravi, Rawana and Oshadha, were extracted with ethanol and methanol separately and used in evaluating total phenolic content (TPC), total flavonoid content (TFC), ferrous ion chelating (FIC) activity, 2-azino-bis (3-ethylbenzothiazoline-6-sulfonic) acid ($ABTS^+$) radical scavenging activity, 1,1-diphenyl-2-picryl-hydrazyl (DPPH) radical scavenging activity, ferric reducing antioxidant power (FRAP) and oxygen radical absorbance capacity (ORAC) *in vitro* (n=6). Data of each experiment were statistically analysed. There were significant differences ($P<0.05$) in investigated AP among three varieties and between methanol and ethanol extracts. Methanolic extracts of FMV showed significantly high ($P<0.05$) activity compared to ethanolic extracts except for ORAC of Ravi and Oshadha. Methanol and ethanol extracts of Ravi and Oshadha exhibited the highest antioxidant activities for all the investigated AP except for TFC, FRAP and ORAC. Both extracts of Ravi showed significantly high ($p<0.05$) TFC and there were no significant differences ($p>0.05$) between Rawana and Oshadha in both extracts. In FRAP and ORAC both extracts of Oshadha showed significantly high ($p<0.05$) activity when compared to other two varieties. Methanolic extract of Oshadha showed the highest DPPH radical scavenging activity (IC50: 62.06 ± 0.58 µg/ml) and methanolic extract of Ravi showed the highest $ABTS^+$ radical scavenging activity (IC50: 11.56 ± 0.15 µg/ml). When comparing with reported antioxidant properties of commonly consumed cereals in Sri Lanka, such as white rice, red rice and wheat, all three FMV possess high activities for all the investigated AP. Therefore, consumption of locally grown FMV may contribute in prevention and dietary management of oxidative stress associated chronic diseases.

Keywords: Antioxidant Properties, Finger Millet, Phenolic Content, Radical Scavenging Activity

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