Chemical and Antioxidant Characterization of Dovyalis Caffra and Dovyalis Abyssinica Fruits in Kenya

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Abstract

This study aimed at chemical characterization of Dovyalis caffra (Hook.f. & Harv.) Sim. and Dovyalis abyssinica (A. Rich.) Warb. fruits from Kinamba Town (KT) in Laikipia county and Gitoro Forest (GF) in Meru county of Kenya. All analysed fresh fruit samples had low pH values averaging at 2.67. Other tests showed D. abyssinica-GF to be significantly inferior to D. caffra-GF and D. caffra-KT in terms of TSS, TSS:TTA ratio, and ascorbic acid content. Based on these parameters, D. caffra-KT presents itself with a higher potential for direct consumption as compared to D. caffra-GF. Proximate analysis of dried fruit pulps demonstrated D. abyssinica-GF to be significantly higher in ash content and significantly lower in protein and fat contents compared to the other two samples. There were insignificant difference in the fibre and carbohydrate contents of all the fruit samples. In phytochemical analysis, D. caffra-GF recorded the highest total polyphenol content of 1845 mg Gallic acid equivalent (GAE)/100 g while D. abyssinica-GF reported the lowest figure of 1128 mg GAE/100 g. Flavonoid and simple phenols fractions were in the range of 18.15–26.85% and 73.15–81.85% respectively in all fruit samples. As for antioxidant activity, D. caffra-GF recorded significantly high scores in both DPPH and CUPRAC assays, and D. abyssinica-GF the lowest. The range of DPPH and CUPRAC scores for all samples was 1995–4993 mg L-ascorbic acid/100 g and 1384–2303 mg L-ascorbic acid/100 g respectively. The current study presents the nutritional and health potential of D. caffra and D. abyssinica fruits. This forms a good basis for future adoption and exploitation of these fruits.

Keywords

Robotic constructionVirtual realityDroneRobotic armConstruction simulationAssembly