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Phenolic Content and Antioxidant Potential of Selected Nigerian Herbs and Spices: A Justification for Consumption and Use in the Food Industry

Authors : Amarachi Delight Onyemachi, Gregory Ikechukwu Onwuka

Abstract : The growing consumer trend for natural ingredients, functional foods with health benefits and the perceived risk of carcinogenesis associated with synthetic antioxidants have forced food manufacturers to look for alternatives for producing healthy and safe food. Herbs and spices are cheap, natural and harmless sources of antioxidants which can delay and prevent lipid oxidation of food products and also confer its unique organoleptic properties and health benefits to food products. The Nigerian climate has been proven to be conducive for the production of spices and herbs and is blessed bountifully with a wide range of them. Five selected Nigerian herbs and spices Piper guieense, Xylopia aethopica, Gongronema latifolium and Ocimum gratissimum were evaluated for their ability to act as radical scavengers. The spices were extracted with 80% ethanol and evaluated using total phenolic capacity (TPC), DPPH (1,1-diph diphenyl-2-picrylhydrazyl radical) ABTS (2,2'azinobis-(3-ethylbenzthiazoline-6-sulfonic acid)), total antioxidant capacity (TAC), reducing power (RP) assays. The TPC ranged from 5.33 µg GAE/mg (in Gongronema latifolium) to 15.55 µg GAE/mg (in Ocimum gratissimum). The DPPH and ABTS scavenging activity of the extracts ranged from 0.23-0.36 IC50 mg/ml and 2.32-7.25 Trolox equivalent % respectively. The TAC and RP of the extract ranged from 6.73-10.64 µg AAE/mg and 3.52-10.19 µg AAE/mg. The result of percentage yield of the extract ranged from as low as 9.94% in Gongronema latifolium and to as high as 23.85% in Xylopia aethopica. A very strong positive relationship existed between the total antioxidant capacity and total phenolic content of the tested herbs and spices (R2=0.96). All of the extracts exhibited different extent of strong antioxidant activity, high antioxidant activity was found in Ocimum gratissimum and Gongronema latifolium with the least. However, Gongronema latifolium possessed the highest total antioxidant capacity. These data confirm the appreciable antioxidant potentials and high phenolic content of Nigerian herbs and spices, thereby providing justification for their use in dishes and functional foods, prevention of cellular damage caused by free radicals and use as natural antioxidants in the food industry for prevention of lipid oxidation in food products. However, to utilize these natural antioxidants in food products, further analysis and studies of their behaviour in food systems at varying temperature, pH conditions and ionic concentrations should be carried out to displace the use of synthetic antioxidants like BHT and BHA.

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