Investigation of the Chemical Composition and Biological Activity of Xylopia Aethiopica Dunal (Annonacae)

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Abstract

The phytochemical composition and physicochemical properties of oil extractable from the fruits of Xylopia aethiopica were determined. Extracts' effects on cell membrane stability and prostaglandin synthetase activity were also evaluated. X. aethiopica oil extracted with chloroform: methanol (2:1, v/v) mixture contained carbohydrates, glycosides, flavonoids, saponins, tannins and phytosterols. The characteristic volatile and sweet smelling nature of X. aethiopica was predominantly inherent in this fraction. The sterol content was 64.30 mg/100 ml; with a high degree of unsaturatedness as evident in its high iodine value (85.76). High pressure liquid chromatographic analysis of the lipid extract revealed a fatty acid profile of palmitic acid (19.21%), palmitoleic acid (0.81%), stearic acid (4.54%), oleic acid (39.12%), linoleic acid (25.98%) and linolenic acid (1.10%). Investigation of the effect of the extract on hypotonicity- induced haemolysis of human red blood cells produced by water showed that the methanol extract of X. aethiopica (XAME) stabilized the red blood cells against the haemolytic action of distilled water. The lipid extract, on the other hand did not show any protective action against the osmotic shock. Xylopia aethiopica fruits may therefore be helpful in the maintenance of the integrity of the cellular membranes. The lipid extract also, in vitro, exhibited a prostaglandin synthetase substrate activity, whereas the methanol extract enhanced the synthesis of prostaglandins using X. aethiopica oil as substrate. The presence of appreciable quantity of unsaturated fatty acids, stabilization of the cellular membrane integrity, promotion of the biosynthesis of the hormone-like substances, prostaglandins, may be responsible for the usefulness of X. aethiopica fruits in the healing of wounds, inflammatory disorders and treatment of post-natal pains.

Keywords: Xylopia, linoleic acid, membranes, haemolysis, pains.