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Evaluation of the effects of Kolaviron (*Garcinia kola*) on the elemental metabolism in the rat liver and kidney using PIXE, RBS and SEM

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Poor or no antioxidant activity has been implicated in the aetiology of various pathologies. Since antioxidants are mostly derived from natural resources, the search for medicinal plants, that can either cure or alleviate ailments, has been phenomenal over the past decades. One plant, *Garcinia kola*, the oil of which is termed kolaviron, has been identified to have possible antioxidant activity [1]. Trace elements such as Fe, Mn, Cu, Zn and Se, form an integral part in antioxidant activity, especially in organ metabolism. In this study organ (liver and kidney) metabolism of major Such as C, O, N, S, and trace elements is investigated. The kolaviron was dissolved in corn oil. Two groups (control and experimental) of Wistar rats were selected. The animals were housed in accordance with the WHO animal regulations. Both groups had ad libitum access to standard rat chow and potable tap water. The control group was fed, by gavage, with 200 microlitre of the solution of kolaviron in corn oil once per day for a period of 4 weeks. After this period the animals were sacrificed by intraperitoneal injection of pentobarbitone. The organs were excised and homogenised into smaller parts which were freeze-dried -80°C. The freeze-dried organ was then pulverized and press into a palette. Concentrations of trace elements were determined with proton-induced X-ray emission (PIXE). PIXE was selected since with this technique concentrations down to minimum detection limits (MDLs) of parts per million (ppm) can be determined. A beam of 3 MeV protons was used for bombardment and a Be filter of 125 micrometer thickness for absorption. Backscattering spectrometry (BS) was used to determine the matrix composition. PIXE and BS measurements were determined simultaneously. Scanning electron microscopy was used both as complementary and supplementary to PIXE and BS.

Statistical tests of $p < 0.5$ were considered significant.