

A Study of the Toxicants and Biomarkers of Oxidative Stress in Samples from Ebubu and Elele-Alimini Communities in Rivers State

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Abstract. This study was carried out to assess the levels of heavy metals, polycyclic aromatic hydrocarbons (PAHs), and antioxidants present in pumpkin leaf (*Telfairia occidentalis*), catfish (*Clarias anguillarus*), and African land snail (*Archachatina marginata*), obtained from Ebubu and Elele-Alimini communities in Rivers State, Nigeria. The heavy metals and PAHs were analyzed using Atomic Absorption Spectrophotometry (AAS) and gas chromatography respectively, while the antioxidants were assayed by conventional methods. Soil samples at Ebubu contained significantly higher Pb, Cr, Cd, and Ni contents than that of Elele-Alimini. The pumpkin leaf from Elele-Alimini contained higher Pb, Zn, Cd, and Fe levels. Cr was undetected in the snails from both locations, while Cd and Ni contents of the snails and catfish at both communities were comparable. For the PAHs, the soil samples from Ebubu contained mostly anthracene (93.37 ppm), benzo[k]fluoranthene (74.36 ppm), fluoranthene (72.64 ppm), and acenaphthylene (47.38 ppm), while those from Elele-Alimini contained more of dibenz[a,h]anthracene (38.65 ppm) and naphthalene (20.55 ppm). Pumpkin leaves from Ebubu were mostly composed of naphthalene, indeno[1,2,3-cd]pyrene, and dibenz[a,h]anthracene, which were undetected in pumpkin leaf samples from Elele-Alimini. In the snail and catfish from Ebubu, acenaphthylene and fluoranthene respectively were the most occurring PAHs, whereas pyrene and phenanthrene respectively had the highest occurrences in snails and catfish from Elele-Alimini. Results for the antioxidant enzymes: catalase and superoxide dismutase in both snails and catfish from Elele-Alimini were significantly higher than those from Ebubu whereas samples from Ebubu contained significantly higher glutathione and malondialdehyde levels. The level of toxicants shown in the foods analyzed in this study is suggestive of potentials to pose significant health risks to the populace when consumed.

Keywords: PAHs, heavy metals, antioxidants, snail, catfish.

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