

Health risk assessment of polychlorinated biphenyls exposure from inland rivers sediments in Warri-South, Warri, Delta State

Shedrack Oritsetimeyin AMURUN,¹ Joel OKPOGHONO*,² and Clifford Iheanyichukwu ANUNUSO¹

¹*Department of Chemical Sciences, Novena University, Ogume, Delta State, Nigeria*

²*Department of Biochemistry, Faculty of Science, Delta State University of Science and Technology, Ozoro, Delta State, Nigeria*

Abstract. The health risk of polychlorinated biphenyls (PCBs) exposure from Ugbuwangue, Ugbori and Edjeba rivers sediments in Warri-South, Warri, Delta State was investigated. Nine sediment samples were collected; three samples each along the course of the different rivers. The sediment samples were Soxhlet extracted with acetone/dichloromethane/*n*-hexane (1:1:1 v/v). A total of 28 PCBs were quantified using gas chromatography coupled with mass spectrometry detector. The concentration of the 28 PCBs ranges from 178.76-1398.29 ng g⁻¹ for Ugbuwangue river, 224.81-685.19 ng g⁻¹ for Ugbori river and 539.33-7858.3 ng g⁻¹ for Edjeba river. The concentration of 12 PCBs were recorded for dioxin-like PCBs ranged from 0.08-401.52 ng g⁻¹ (Ugbuwangue river 0.13 to 223.11 ng g⁻¹, Ugbori river 0.08 to 153.39 ng g⁻¹ and Edjeba river 0.32 to 401.52 ng g⁻¹), while the concentration of 16 non-dioxin-like PCBs were recorded ranging from 0.13-4245.71 ng g⁻¹ (Ugbuwangue river 0.18 to 386.47 ng g⁻¹, Ugbori river 0.13 to 111.98 ng g⁻¹ and Edjeba river 0.31 to 4245.71 ng g⁻¹). The ecological risks of the nine sediment samples were investigated and it ranges from 25.52 – 1122.616 with Edjeba river sediment having the highest ecological risk while Ugbuwangue river sediment has the least ecological risk.

Keywords: polychlorinated biphenyl; river; sediment; ecological risk.

* Corresponding author. *E-mail address:* okpoghono@gmail.com (Joel Okpoghono)