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*"Searching for African Solutions to Human and  
Environmental Toxicological Challenges"*

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**Abstract booklet  
& Final Program**



ORGANISATION FOR THE PROHIBITION  
OF CHEMICAL WEAPONS (OPCW)

SOT

Society of  
Toxicology

Creating a Safer and Healthier World  
by Advancing the Science of Toxicology

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Cost of insecticides, environmental pollution and insecticides resistance had been the most emerging problems that restrict the continuous use of chemical insecticides for pests and vectors control. The plant kingdom houses a diversity of plant species that form possible alternatives for chemical insecticides. The neem tree (*Azadirachta indica* A. Juss) proved to be one of the most promising among plant species. The present work was conducted to test synergism in neem extracts against *Culex quinquefasciatus* larvae by mixing them with sesame oil and potentiation when mixing neem formulations with standard mosquito insecticides to reduce the cost. Results of experiments revealed that neem oil (NO) was the most effective against *Culex quinquefasciatus* 3<sup>rd</sup> instar larvae than neem seeds water extract (NSWE). On the other hand mixing sesame oil with both (NSWE) and (NO) produced synergistic effect significantly increasing the larval mortality of *Culex quinquefasciatus*. Furthermore the synergized (NO) was more effective than the synergized (NSWE). Results also showed significant potentiation of standard mosquito insecticides Abate (Temephos) and Malathion when mixed with NO and NSWE. Abate (0.0002%) + NSWE (0.0002%) and Malathion (0.0002%) + NSWE (0.0002%) were equally effective against mosquito larvae as the insecticides alone at full conc. (0.0004%). The same result was obtained using NO/ Abates and NO/Malathion mixtures compared to that of the insecticides at full conc. (0.0004%). The relative potency of neem oil, neem oil/sesame oil and Abate/neem oil mixtures was assessed in terms of LC50 and LC95 values.

ENVPF8 – 14.45 pm

**Investigating the level of air toxics in the outdoor air in Freetown, Sierra Leone.**

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The knowledge to understand the state of the environment is necessary to address environmental problems based on risk management and public health but lack of monitoring data in Sierra Leone makes it difficult to address public health concerns. To evaluate the outdoor air level of toxic air pollutants during the wet summer and dry winter seasons in Freetown, Sierra Leone as the first step to investigate and manage the potential environmental problems such as open burning of solid wastes emission from industries and automobile exhausts. The ambient air of Freetown was monitored for polycyclic aromatic hydrocarbons [PAHs], nitrogen dioxide [NO<sub>2</sub>], sulphur dioxide [SO<sub>2</sub>] and carbon

monoxide [CO] across industrial, residential and traffic sites in September 2010. Samples for 11 USEPA's priority PAH pollutants were analyzed for PM<sub>2.5-10</sub>, and PM<sub>2.5</sub> by HPLC FLD NO<sub>2</sub> and SO<sub>2</sub> samples collected by Ogawa diffusion tubes were analyzed by ion chromatograph with CO directly being monitored. The sum of PAHs across the sites is 11.9 and 77.8 ng/m<sup>3</sup> for PM<sub>2.5-10</sub> and PM<sub>2.5</sub>. Mean concentration of NO<sub>2</sub> is 32.7, 12.6, 42.7 µg/m<sup>3</sup> and SO<sub>2</sub> is 2.1, 1.8, 6.1 µg/m<sup>3</sup> at industrial, residential and traffic sites. Mean concentration of CO is 5, 4 and 7 ppm at the same sites. The preliminary results suggested that more PAHs are found in PM<sub>2.5</sub> at all the sites with the highest contribution coming from traffic. Results of NO<sub>2</sub>, SO<sub>2</sub> and CO showed relatively low concentrations across the sites which cannot be conclusively reported because of the initial field set up.

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ENVPF9 – 15.00 pm

**Passive air monitoring of Polychlorinated naphthalene in Ghana**

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As compounds that exhibit characteristics similar to most POPs, polychlorinated naphthalenes (PCNs) have been suggested as candidate POPs. Their concentrations in air were monitored nationwide in Ghana for the first time applying polyurethane foam (PUF) disk passive air sampler (PAS). Σ<sub>63</sub> PCNs concentration was averagely 49 pg/m<sup>3</sup>, higher than what has been presently observed in East Asia. Tri- and tetra-CN's constituted approximately 90% of total PCN homologues in the atmosphere, which provided evidence of strong volatilization of these pollutants as a result of high tropical temperatures. Emissions were generally greater along the coastal southern parts of Ghana compared to the middle and northern belts. Even rural sites in the southern regions had concentrations that exceeded those of urban sites in the mid to northern regions. The sampling point with the highest concentration was located at Teshie, a district in Accra which harbored very huge open waste dumpsite notorious for open burning of waste. Combustion might thus constitute a major source of PCNs in Ghana. A more detailed evaluation of congener profiles is being undertaken to factor out all other potential local sources of PCN emissions in the country.