

## **Evaluation of distribution and sources of sewage molecular marker (LABs) in selected rivers and estuaries of Peninsular Malaysia**

### **ABSTRACT**

This is the first extensive report on linear alkylbenzenes (LABs) as sewage molecular markers in surface sediments collected from the Perlis, Kedah, Merbok, Prai, and Perak Rivers and Estuaries in the west of Peninsular Malaysia. Sediment samples were extracted, fractionated, and analyzed using gas chromatography mass spectrometry (GC-MS). The concentrations of total LABs ranged from 68 to 154 (Perlis River), 103 to 314 (Kedah River), 242 to 1062 (Merbok River), 1985 to 2910 (Prai River), and 217 to 329 ng g<sup>-1</sup> (Perak River) dry weight (dw). The highest levels of LABs were found at PI3 (Prai Estuary) due to the rapid industrialization and population growth in this region, while the lowest concentrations of LABs were found at PS1 (upstream of Perlis River). The LABs ratio of internal to external isomers (I/E) in this study ranged from 0.56 at KH1 (upstream of Kedah River) to 1.35 at MK3 (Merbok Estuary) indicating that the rivers receive raw sewage and primary treatment effluents in the study area. In general, the results of this paper highlighted the necessity of continuation of water treatment system improvement in Malaysia.

**Keyword:** Linear alkylbenzenes (LABs); I/E ratio; Perlis River; Merbok River; Prai River; Malaysia