

ORGANOPHOSPHATES IN MECONIUM OF NEWBORN BABIES WHOSE MOTHERS RESIDED IN AGRICULTURAL AREAS OF THAILAND

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Abstract. Organophosphates (OPs) are widely used for pest and weed control in many countries including Thailand. In addition to causing environmental pollution, OPs affect human health by overstimulating neurotoxins, and OP exposure during pregnancy can lead to adverse health effects of mothers and their fetuses. Using gas chromatography-mass spectrometry with a dedicated extraction protocol to identify OPs in meconium of newborn babies ($n = 68$) from hospitals in Amnat Charoen, Kanchanaburi and Nakhon Sawan provinces, agricultural regions of Thailand, among ten OP types analyzed, eight were detected in 98% of meconium samples (chlorpyrifos (median $\pm$ interquartile range (IQR) 0.08 ± 0.03 - $0.16 \mu\text{g/g}$) in 32% of samples, demeton-s-methyl (0.35 ± 0.26 - $0.49 \mu\text{g/g}$) in 73%, dichlorvos (0.67 ± 0.58 - $0.71 \mu\text{g/g}$) in 38%, dimethoate (0.43 ± 0.09 - $1.56 \mu\text{g/g}$) in 50%, ethion (0.21 ± 0.19 - $0.26 \mu\text{g/g}$) in 12%, malathion (0.28 ± 0.15 - $0.52 \mu\text{g/g}$) in 50%, omethoate (5.63 ± 4.85 - $8.57 \mu\text{g/g}$) in 34%, and tolclofos-methyl (0.08 ± 0.03 - $0.10 \mu\text{g/g}$) in 41%). There are no significant differences in these parameters from babies whose mothers did and did not work in the agricultural or who lived near (within one km) and distant from farmland. The findings should be of benefit in developing programs to protect pregnant women and newborn babies from exposure to OP pesticides.

Keywords: GC-MS, meconium, organophosphate, pesticide, Thailand

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