Occurrence of Diuron, Irgarol and Fenitrothion in Kurose River water, Higashi-Hiroshimashi, Japan
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Introduction: The presence of pesticide residues in surface water bodies is one of the most important environmental concerns. Pesticides include Fenitrothion (O,O-Dimethyl O-(3-methyl-4-nitrophenyl phosphorothioate) (An Acetylcholinesterase Inhibitor), Diuron (3-[3,4-dichlorophenyl]-1,1-dimethylurea) and Irgarol (2-[tert-butylamino]-4-[cyclopropylamino]-6-[methylthio]-1,3,5-triazine) (Both Photosystem II Inhibitors). Diuron, Irgarol and Fenitrothion are toxic to reef building (hermatypic) corals, non-target algae and wide variety of aquatic organisms respectively hence the need for their continuous monitoring.

Experimental: Water samples were collected from Kurose River (Namitakiji, Tokumasakami, Izumi, Ochiya, Hinotsume and Kurosebunka Centre) in Higashi-Hiroshima at monthly intervals. Pesticide extraction was by Solid Phase Extraction (SPE) according to the method of Itagaki et al., (2000). Sample analysis was by an HPLC system equipped with an UV-Vis detector (SPD-10A, Shimadzu).

Results and discussion: The pesticide ranges were; Diuron (not detected (n.d) – 4620ng/L), Irgarol (n.d – 50ng/L) and Fenitrothion (n.d – 310ng/L). Namitakiji (Upstream of Kurose River) was the least polluted of all sampling points. Izumi (Midstream; Sampling point after the river has passed through rice fields and urban area) was the most polluted of all the sampling points. Figure 1 below shows the trend in pesticide levels at Izumi. Diuron levels were highest in May which is the time rice fields are prepared for planting. Fenitrothion levels were highest in April attributed to its use in rice nursery beds. Irgarol levels (Only detected at Izumi) were highest in May but lower than Diuron (Attributed to the fact that Irgarol source are protective paints for structures and not rice fields). Results compare well with studies done by Sakugawa et al., (2010), who found highest levels of Diuron at Misonou (An area close to Izumi). Fenitrothion and Irgarol results also compared well with other studies done in the same area.