

PPCPs pollution in an urban watershed in Musashino upland, Tokyo

HAYASHI, Takeshi^{1*} ; YASUHARA, Masaya² ; NAKAMURA, Takashi³

¹Faculty of Education and Human Studies, Akita university, ²Geological Survey of Japan, AIST, ³ICRE, University of Yamanashi

Human activities discharge various chemical substances to water environment in urban area around the world. Some substances are concerned to affect health of human and aquatic organism because these substances are hardly decomposed not only in natural environment but also water treatment plant. We study on shallow groundwater environment in Musashino upland, Tokyo to evaluate sources and recharge processes of groundwater and present state of groundwater pollution by domestic wastewater (e.g. Hayashi et al., 2012; Nakamura et al., 2013; Yasuhara et al., 2013). Based on the result of our previous research, we newly collected water samples of river water and shallow unconfined groundwater in the watershed and measured PPCPs components. Three samples of river water were taken from two rivers: a natural river mainly recharged by groundwater and an artificial river recharged by treated waste water. 15 groundwater samples were collected from private wells that were distributed in the watershed of the natural river. As for PPCPs, 78 substances were measured by semi-quantitative analysis and another six substances (amantadine, caffeine, carbamazepine, crotamiton, ibuprofen, N,N-diethyl-m-toluamide) were measured quantitatively.

As for river water samples, 19 substances from semi-quantitative analysis and six substances from quantitative analysis were detected in the artificial river, and three substances from semi-quantitative analysis and five substances from quantitative analysis were detected in the natural river. On the other hand, only one substance from semi-quantitative analysis and four substances (amantadine, carbamazepine, crotamiton, N,N-diethyl-m-toluamide) from quantitative analysis were detected in groundwater samples in both peri-urban upstream area and urbanized downstream area.

We present present characteristics of PPCPs components and spatial distribution in the study area.

Keywords: Musashino upland, urban river, shallow groundwater, pollution, PPCPs