The effect of canopy interception processes on radiocesium and dissolved matter concentrations in throughfall

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This study examined the effects of canopy interception processes on the formation of throughfall and dissolved matter concentrations under the canopy. The concentrations of radiocesium and dissolved matter in throughfall were measured in the cedar forest stand located in Namie Town, Fukushima Prefecture. Furthermore, we investigated the influence of canopy structure on the generation of spatial heterogeneity in rainwater amount and dissolved matter concentrations in throughfall. The study period was about 4 months from June 25 to November 5, 2018. The results of this study indicated that the amount of thgoughfall increased with canopy openness. The Cs-137 concentration tended to decrease as the amount of throughfall increased, and consequently the transfer flux of Cs-137 from the canopy to the forest floor by the throughfall did not increase even if the throughfall increase. The particulate form of Cs-137 contained in the throughfall tended to decrease as the amount of throughfall increased. However, during large rainfall event such as typhoon, the proportion of the particulate Cs-137 increased regardless of throughfall amount. On the other hand, the dissolved Cs-137 and Mg^{2+}, Ca^{2+}, and K^{+} concentrations in throughfall decreased with the increase of canopy openness. These results suggested that rain properties and canopy structure affect the leaching flux of radiocesium from the canopy to rainwater. The periodical transfer flux of Cs-137 from the canopy to forest floor via throughfall was 0.25% of the initial atmospheric deposition (June 25 –September 13, 2018).

Keywords: radiocesium, canopy interception process, throughfall, monitoring

