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# Subsurface Flow and Dissolve Organic Carbon (DOC) Pathways in a Forested Headwater Catchment

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Soils under forested catchment are generally rich in organic matter, yet the role of organic soil layers in flow governing hydrochemical processes has rarely studied. Understanding the subsurface process and the role of rich organic matter A horizon has been studied in Kawakami forested headwater catchment, Central Japan. The catchment is dominated by Inceptisols with 0.2-0.3 m of peat covering the soil in the riparian zone. Oak (*Quercus mongolica* Fisch) and bamboo grass (*Sasa nipponica*) are dominant vegetation in the catchment. The study is aimed to elucidate the subsurface flow and the role of DOC pathways in generating stream flow and chemistry. Hydrometric and dynamic behavior of dissolve organic carbon (DOC) as well as its variation were recorded in a transect across hillslope and riparian zone. The results showed that DOC have a specific trend across the riparian and the hillslope areas. During baseflow condition, DOC decreased with depth and away from the stream channel. The change in DOC concentration was clearly controlled by the flow pattern. In the near surface riparian, where the lateral flow was relatively steady and sustained in the direction of the stream, may facilitate the flushing high concentration of DOC. In the riparian zone, DOC concentration at the surface horizons of 0.3 and 0.6 m deep tend to decrease near the peak storm, which attributed to flushing of its high concentration. Under the three components mixing model involving the near surface riparian, the deep riparian groundwater, and the hillslope soil water contributing to storm runoff, DOC was in concave clockwise rotation with positive trend correspond to Evans and Davies (1998) case in which $C_{NSR}$>$C_{HSW}$>$C_{DRG}$ (C2 model). This was well confirmed with (a) the hydrochemistry data in which the concentration of DOC was higher in the near surface riparian zones, and (b) the hydrometric data in which the highest contributor to the storm runoff was the near surface riparian. The C2 model is the highest level of

flushing in the sequence proposed by Evans and Davies (1998) confirming the highest control of the near surface riparian zone on the stream DOC concentrations.