

The evaluation of the infiltration through stemflow in a warm-humid forested catchment

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Many studies of the run-off process are done in a lot of regions, and, up to now, these results have been reported. And, contribution from the stemflow to the run-off process is disregarded in these researches. However, it is thought that contribution from the stemflow can be never disregarded in the forested catchment where the rainfall have high intensity and continue for a long time.

Then, in this study to evaluate the role that the stemflow in the temperate-humid region to the run-off process plays quantitatively, the hydrological observations such as regular water-sampling for a long term and the concentration and seriate water-sampling for the rainfall event period were done in the second watershed and the third watershed in the Kumamoto Prefecture Kahoku experimental watershed being managed by the Forestry and Forest Products Research Institute Kyushu branch office.

The following conclusions were obtained since the hydrogen and oxygen stability isotopes, SiO_2 , and HCO_3 concentrations in the collected sample were measured, and it compared with the hydrological observation data, for example amount of outflow and rainfall.

In both watersheds, riverwater have the residence time in which isotopic seasonal variation is denied, and mainly be recharged Summer rainfall. The water-holding ability of the third watershed is higher than that of the second and the reaction to the rainfall is earlier, and the infiltration capacity in the second watershed might decrease when a constant amount rains, and the amount of the outflow exceed the third watershed. The difference in both watersheds at the attenuation speed becomes small growing of the event though the third watershed shows early attenuation since the peak flow regardless of the size of the rainfall event. In the third watershed, SiO_2 becomes a suitable tracer, when the hydrograph separation is conducted,

Based on the above-mentioned result, The quantitative evaluation of the stemflow that uses the tank model in the third watershed done, therefore it has been understood that the contribution of the stemflow to the run-off process is about 6.86mm, and catching area (33.92m²) of this stemflow corresponds to 1.59 times canopy projection area (21.4m²) in the rainfall event from 3rd to 6th in December.