



## **Controlling factors for infiltration on undisturbed hillslopes in unmanaged plantation forests**

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Infiltration into the soil is a crucial factor for predicting overland flow generation. Infiltration capacity strongly relates to ground vegetation, soil characteristics, or both. For revealing controlling factors for infiltration capacity, we conducted in-situ rainfall simulation using an oscillating-nozzle type rainfall simulator at 26 plots with different ground cover conditions of unmanaged Japanese cypress (*Chamaecyparis obtusa*) plantations. For wide-ranging vegetation cover condition (0-100%), infiltration capacity widely varied (5–322 mm/h) and had positive correlations with indices of ground vegetation and ground litter ( $p < 0.01$ ). For a limited vegetation cover condition (0-20%), the range of infiltration capacity (7-114 mm/h) was associated with ground litter thickness ( $p < 0.05$ ), and difference in soil organic matter and difference in soil bulk density. Principal component analysis showed that the first and second principal components (70% of total variation) related to changes in above- and below-ground biomass and changes in pores in soil. Our findings showed that development of ground vegetation alters hydrological processes of surface soil through changes in soil characteristics via the propagation of belowground biomass development.