

Nutrient cycling process in canopy of a beech forest at a mountainous area in Chichibu

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Forest canopy plays an important role in nutrient cycling in forest ecosystem in that the canopy receives various substances from the atmosphere as wet and dry depositions, and alters their compositions through leaching and uptake at the canopy. Net throughfall deposition, a value given by subtracting wet deposition from total deposition to the forest floor (throughfall plus stemflow depositions), indicates the sum of dry deposition and canopy exchange (positive when canopy leaching and negative when canopy uptake). Based on annual data set of wet, throughfall, stemflow depositions in canopy trees of *Fagus crenata*, *F. japonica*, and *Tsuga sieboldii* at a mixed forest in a mountainous area in Chichibu, we observed net throughfall depositions in the three individuals to elucidate the nutrient input in these canopies. Wet deposition at the study site was in low levels for many substances compared to previous studies, because the study site is remote from oceans, major cities, and industrial regions. For all the sampled three individuals, net throughfall depositions of Na^+ , Cl^- , and SO_4^{2-} were relatively low as compared with those reported in previous studies in Japanese forest sites, implying low dry depositions originating from both sea-salt and anthropogenic burning of fossil fuels. For the *F. crenata* tree, K^+ leaching from the canopy was more significant than for the other two species. Net throughfall deposition of NO_3^- showed negative values for both *F. crenata* and *F. japonica* trees. This indicates that dry-deposited NO_3^- to the canopies of the two individuals was less than their NO_3^- uptakes. An attempt to separate the derived net throughfall depositions into dry deposition and canopy exchange by using Regression model was made to discuss in more detail the nutrient input process in canopy of the studied forest.

Keywords: wet deposition, net throughfall deposition, dry deposition, canopy uptake and leaching