

森林流域の窒素飽和現象解明のための今日的なアプローチと戦略 Relevant approaches and strategies for investigation on the nitrogen saturation in forested catchments

大手 信人^{1*}; 磯部 一夫²; 徳地 直子¹
OHTE, Nobuhito^{1*}; ISOBE, Kazuo²; TOKUCHI, Naoko¹

¹ 京都大学, ² 東京大学

¹Kyoto University, ²University of Tokyo

After the Industrial Revolution, global scale nitrogen (N) cycle has drastically been altered by increase of anthropogenic N emissions to the atmosphere. Inorganic N concentration in atmosphere and their depositions reached unprecedented level in Europe, northeast United States and northeast Asia. These have caused "Nitrogen Saturation" in the forested areas within the high N deposition regions of Europe, North America, China and Japan. Mechanisms of nitrogen saturation have previously been studied from biogeochemical point of view. N dynamics in catchment-scale, however, could not be described sufficiently, because geographical variations of catchment characteristics such as climatic and hydrologic properties are generally large and their effects provide various aspects of responses in high nitrogen depositions. We propose new strategies based on multi-aspects approach combining microbial ecology and catchment hydrology to reconstruct the mechanistic understandings on previously reported ecosystem level biogeochemical responses to the environmental changes such as high N inputs. Combined applications of novel isotopic tracer techniques and newly advanced functional gene analysis onto the multiple forest landscapes will provide us insightful information on spatiotemporal heterogeneity and non-linear responses of N dynamics related to the N saturation phenomena in forest catchments.

キーワード: 森林流域, 窒素飽和, 微生物生態学, 同位体トレーサー, 水文課程

Keywords: forested catchment, nitrogen saturation, microbial ecology, isotope tracer, hydrological processes