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Evaluation of the acid deposition on to Aya forest, the UNESCO biosphere reserve forest in Miyazaki, Japan

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The Aya forest is located at the northern limit of the evergreen broad-leaved forest zone in East Asia. In addition, it has various endemic species in Japan. People who live near Aya forest have been using these natural resources with a sustainable way for more than five decades until now. In July 2012, Aya forest was designated as a UNESCO biosphere reserve, the Man And the Biosphere programme (MAB). In order to preserve this area and its culture, we evaluate the effect of long-range transport air pollution on to the Aya forest ecosystem. The research was conducted in two years, from 2010 to 2012. We installed bulk deposit samplers and Ogawa passive samplers both in-canopy and the outside of forest experimental site. After collecting samples, we measured major ion concentration for wet deposition and NO, NO_2, NH_3, O_3 and SO_2 gaseous concentration for dry deposition, respectively. In addition, to evaluate the actual deposition amount on to Aya forest, we collected conifer needle tree leaves from six trees, which grow up in this area.

During this experimental campaign, we found following things. In 2010, the effect of eruption of Mt. Shin'moe was observed. However, we couldn't find the effect of long range transport of air pollution from East Asian continent which was shown in Yakushima Island experimental site. The result of conifer needle tree leaves provide us the different SO_4^{2-} concentration level between north and south side of leaves which were collected from the same tree. This tendency was observed in all collecting samples.

Keywords: Aya biosphere reserve, Atmospheric acid deposition, Long range transport, Man And the Biosphere, conifer needle tree