

Three decades trend of fog in Mt. Oyama, Japan

Yize Wang (1), Hiroshi Okochi (2), and Manabu Igawa (1)

(1) Kanagawa University, Faculty of Engineering, Yokohama, Japan (igawam01@kanagawa-u.ac.jp), (2) Graduate School of Creative Science and Engineering, Waseda University

Context/Purpose: We have observed fog characteristics and deposition of air pollutants in Mt. Oyama situated at the southwest of Tokyo for over 30 years. Such a long observation is limited in the world, and the air pollution has been improved in the duration. Three decades trend will be summarized, and the properties of the trend will be reported in this report.

Method: We have collected gas, fog, rain, throughfall, and stream water at the mountain (summit: 1252m) and analyzed them since 1988. Weather phenomena were also observed for wind direction and velocity, temperature, humidity, visibility, and rainfall intensity.

Results/Interpretation: The air pollution has been improved in Japan, and its largest effect on fog is the decreasing frequency of the severe acid fog event. The fog water pH is increasing gradually, and pH is relatively low in spring when the air mass is transported from the continent. Because of the improved air pollution in Japan, the effect of the transboundary pollution may become significant. Formation of fog is facilitated by the increasing concentration of condensation nuclei, particulate matter, which is also decreasing, but the fog frequency has been almost constant, about 30%, at the summit for recent 10 years. However, the precipitation of throughfall has been decreased gradually, although the precipitation of rain is almost constant for years. The difference of the precipitation between throughfall and rain is caused by fog deposition, and the fog sample amount collected in the passive fog collector in the mountain is also decreasing. The nitrate and sulfate concentrations are decreasing in the fog water, although sodium and chloride concentrations are constant. Therefore, the effect of air pollutants on the trees in the mountain has been decreasing, although the ozone concentration has been increasing gradually in this region.

Conclusion: Environmental effect of the acid fog has been decreasing in the mountainous site near the metropolitan city, Tokyo, because of the improving air pollution in Japan.