

Damages of the world trees caused by sulfuric acid of the air pollutant

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Air pollutants discharge sulfur oxides in proportion to the emissions of carbon dioxide resulting from combustion of fossil fuels. Sulfur oxides become sulfuric acid and are accumulated in the air unless they fall on the ground with the rain or snow. Sulfate ion was found in the ice core of 1785 in Greenland¹⁾, and the fossil fuel has been burning for 230 years. Sulfuric acid in the air sticks to the trees that stand in the areas where the polar vortex in the Southern Hemisphere and the westerlies in the Northern Hemisphere pass through, and then it is dropped to the ground with the rain. Sulfuric acid transforms the metal component of the soil (Al, Fe) to a soluble compound of sulfate, and the metal ions dissolved in rainwater are absorbed by the trees. Following the principle that coexisting substances become the compound with the strongest bonding power, the metal ions take the phosphoric acid from the phosphate compound in the trees and become an insoluble metal phosphate compound. Trees become the same phenomenon as the shortage of phosphoric acid and decline. Declined trees lose the resistance over damage by blight and harmful insects.

Beech and eucalyptus in Fuego Island in Argentina, at the southern tip of South Island of New Zealand, in Perth in Australia near the polar vortex in the Southern Hemisphere are completely destroyed. The westerlies in the Northern Hemisphere pass Japan and withered conifer and broad leaf trees, then travel beyond the Pacific Ocean and withered conifer trees in the southwest of British Columbia, Canada²⁾. Westerlies that pass through the United States absorb additional sulfuric acid from the thermal power plant near the Great Lakes and withered conifer trees in the Adirondack district in the state of New York and go across the Atlantic Ocean and withered trees in Europe.

When charcoal is sprayed, the acid soil is neutralized with potassium compounds contained in charcoal and metal ions become hydroxides which can no longer be absorbed by trees and the phosphoric acid is protected. Potassium is an essential element of trees and it helps the growing of trees and the weakened trees recover. From this fact, we can prove that the damage of trees is due to the acidification of the soil with sulfuric acid of air pollutants³⁾.

When pines weaken, the amount of pine resin decreases and tannin loses an insect repellent ability when it is combined with metal ions. As a result, it becomes easier for insects to get into trees and increase explosively.³⁾

References

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