

**C -2 Studies on the impacts of acidic pollutants on the life environmental systems  
(Final Report)**

**Contact person** Kenichi Satake  
Head, Acid deposition research team  
Global Environment Division  
National Institute for Environmental Studies  
Environment Agency  
Onogawa 16-2, Tsukuba, Ibaraki, 305 Japan  
Tel: +81-298-50-2447 Fax: +81-298-56-7170  
E-mail: [ksatake@nies.go.jp](mailto:ksatake@nies.go.jp)

**Total Budget for FY 1996-2000** 178,554,000Yen (FY2000; 24,551,000Yen)

**Key Words** Acid Deposition, Fungi, Fish, Forest Soil, Yakushima

Impacts of acidic deposition on the ecosystem (life-environment system) is one of the most interdisciplinary environmental problems we are now facing. The study of acid deposition and its impacts ranges widely from deposition levels and processes to impacts on trees, soils, rivers, fishes, and to microorganisms. The main researches were as follows: (1) Impacts of acidification around the tree roots on the microorganisms and nutrient balance of trees, and effect of acidification of environment on wood-decaying fungi (e.g. *Armillaria*). The results suggest that the cause of forest decay has complex process. At least, acidification of soil, strong wind and damage by fungi is closely connected. Also the *Armillaria* of the blighted trees of mountainous region is not *A.mellea* and the pathogenesis is less strong than *A.mellea*. (2) Studies on behavior of aluminum in environment and its chemical speciation. Chemical speciation methods for aluminum in environment were studied and the following four methods were proposed; 1) HPLC with fluorometric detection 2) kinetic method based on 8-quinolinol extraction 3) combined method of HPLC and kinetic method 4) HPLC with ICP-MS detection. These methods revealed the chemical species of aluminum in soil. Considerable parts of the soluble Al were found to be complexed Al with organic or inorganic ligands, the percentage of the soluble Al decreased along with the increase in soil depth. (3) Development and application of assessment systems for the effects of acidification on inland – water fish ecosystems in East Asia. In this study slightly acidic water such as pH 6 levels was enough to inhibit spawning behavior in brown trout and Hime salmon (4) Estimation of neutralizing capacity of freshwater. In many streams on Yakushima island, World Natural Heritage Site, the pH after 0.001N acid input were lower than 6.0 showing the signs of acidification. (5) Acid pollutants and their chemical form, impacts on soil-water-plant system. This study showed that aerosols on the leaves may have increased the transpiration rates, placing *Cryptomeria japonica* under chronic water stress. (6) Aluminum in lake water and organs of a fish *Tribolodon hakonensis* in strongly acidic lakes with a high aluminum. This study showed that aluminum accumulation might be controlled in the fish living in the acid lakes.