



## Rain-enhanced/induced bioecological resuspension of radiocaesium in a polluted forest in Fukushima

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It is the conventional understanding that rain removes aerosols from the atmosphere. However, the question of whether rain plays a role in releasing aerosols to the atmosphere has recently been posed by several researchers. In the present study, we show the additional evidence for rain-enhanced/induced aerosol emissions in a forest environment: the occurrence of radiocaesium-bearing aerosols in a Fukushima forest due to rain. We carried out general radioactive aerosol observations in a typical mountainous village area within the exclusion zone in Fukushima Prefecture to determine the impacts and major players of the resuspension of radiocaesium originally from the nuclear accident in March 2011. We also conducted sampling according to the weather (with and without rain conditions) inside a forest to clarify the atmospheric radiocaesium source from the polluted forest. Thus, we found that rain enhances/induces bursts of radiocaesium-bearing aerosols in forests in Fukushima. With further investigations, we found that the fungal spore sources of resuspended radiocaesium under rainy weather seemed to differ from those under nonrainy weather. Larger fungal particles (possibly conidia-ascospore) are probably emitted during rainy conditions than during nonrainy weather, suggesting that the splash generation by rain droplets is the major mechanism of the suspension of radiocaesium-bearing mould-like fungi. Fungal spores can function as ice and cloud condensation nuclei and cause allergies, and fungal inocula may have a significant impact on agriculture. Therefore, the present findings indicate that radiocaesium could be used as a tracer in research fields such as forest ecology, meteorology, climatology, public hygiene and agriculture.