

Observation and measurement of airborne Japanese cedar and cypress pollen in urban area of Saitama during 2009 pollination season

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【Objective】

Alteration of airborne Japanese cedar and cypress pollen morphology, in this study, will be observed by a scanning electron microscope (SEM) and an optical microscope in order to confirm the existing evidences of visualized suspended particulate matter containing the Japanese cedar and cypress pollen allergens. In addition, pollen counts will be calculated by using the KH3000-01 automatic pollen monitor as well.

【Methods】

Sampling site location: Saitama University campus

Sampling Period: April 1st ~ May 24th

Sampling Devices: KH3000-01 automatic pollen monitor and Burkard sampler

KH3000-01 automatic pollen monitor

This device applies the technology of the semiconductor sensor in a volume method and absorbs air of 4.1L for one minute. Irradiate the atmosphere which it inhaled with a laser beam, and it is a device counting the number of the particles of 28-35 μ m equivalent to Japanese cedar and cypress pollen by the air light automatically. Output the calculation result of the quantity of pollen by setting time when is arbitrary than one minute.

Morphological observation processes

Airborne pollens will be collected on carbon tapes by Burkard sampler and collection time is seven days with each cycle consecutively. Drip dyeing liquor onto carbon tapes of the Burkard pollen sampler, stand for 20 minute later, count the stained pollen and visualized allergen particles by an optical microscope. As the samples for observing form morphological change of airborne pollen grains, the collection of the pollen grain samples on the double-sided carbon tapes will be stored till the observation using a scanning electron microscope (SEM).

【Results and Future Plan】

Fig. 1 shows the morphological image of cedar and cypress pollen allergy by a SEM. Upper left image in both images focused on one pollen grain of them. The main differences between them are the shape of protrusions called Papilla and Ubish bodies respectively. Though time zone that the cedar pollen increases changes with the weather conditions and the daytime of the season, it increases generally after the morning and the sunset as shown in the **Fig. 2**. When temperature rises, pollen grains protruded from the forest in the morning arrives at Saitama urban area after several hours later, it is thought that the airborne pollen may stop to fly in the sky and deposit on the ground after sunset. With the help of analysis of backward trajectory and forward trajectory, we also plan to estimate the pollen source apportionment during the sampling periods.



Fig. 1. Morphological images of two pollen grains collected (Japanese cedar (left) and cypress (right)) by a SEM.

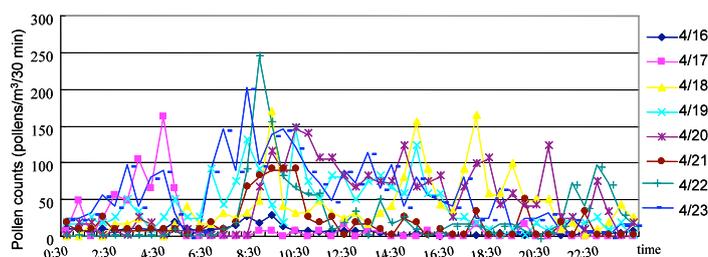


Fig. 2. Pollen counts by Auto pollen monitor

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