



## CCN properties of pollen from selected wind pollinated plants

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Aerosol particles that act as cloud condensation nuclei (CCN) influence cloud albedo and lifetime and thereby affect the planetary radiative balance. The indirect aerosol effect on climate is still one of the largest uncertainties and especially the role of biological particles is not yet well described. Pollen grains are primary biological particles that become airborne during the blooming season of plants. Pollen from wind pollinated plants represent a seasonally significant portion of the organic aerosol in the atmosphere. Intact pollen grains are rather large (10-100  $\mu\text{m}$ ) but under conditions of high humidity pollen grains have been shown to rupture and release cytoplasmic material including a large number of particles much smaller in size (0.5-5  $\mu\text{m}$ ).

In this study we extract soluble and insoluble material from several pollen samples (*Phleum*, *Betula*, *Artimesia*, *Poa*, *Corylus* and *Ambrosia*) and investigate the CCN activity of the extracts in a laboratory study. The main component of the experiment is the continuous-flow streamwise thermal-gradient cloud condensation nuclei counter (CCNC) from Droplet Measurement Technologies (DMT). The CCNC was calibrated with  $(\text{NH}_4)_2\text{SO}_4$ . The activation behavior of  $(\text{NH}_4)_2\text{SO}_4$  is theoretically well described by Köhler equation. For particles which consist of a multitude of organic components it is convenient to represent the chemical composition through the hygroscopicity parameter  $\kappa$ . In the first part of the experiment, we determine the activation diameter at 5 different supersaturations and calculate the kappa parameter for all pollen samples. We find that the values fall in the range from 0.1-0.2, which is typical for particles composed of organic substances. Extracts from *Betula* pollen show the highest hygroscopicity ( $\kappa = 0.18$ ), while extracts from *Artimesia* exhibit the lowest hygroscopicity ( $\kappa = 0.13$ ). In the second part of the experiment we will also investigate the CCN activity of the insoluble material.