



GCCN and IN activity of primary biological particles collected during wet season in the Amazonian tropical rain forest (Manaus, Brazil) - a single particle SEM study

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Single particle analysis of primary biological particles was performed on samples collected in the tropical rain forest (Manaus, Brazil) during the AMAZE campaign in February and March 2008. During wet season, Amazonia is one of the few places on Earth where natural continental aerosol unperturbed by anthropogenic influences can be investigated. Under conditions when influence from outside the Amazon basin is minor, coarse mode aerosol is dominated by primary biological particles. We observe a significant fraction of primary biogenic particles show organic coatings, or mixed coatings with water soluble organics and inorganic salt and/or mineral dust, indicating they underwent wet processing. The abundance of such coatings varies strongly for morphologically distinct types of primary biogenic particles, from less than 10% for some primary biogenic particles to more than 95% for other particle types. While primary biogenic particles with a high frequency of coatings are likely to act as large or giant cloud condensation nuclei (GCCN), primary biogenic particles that do not display such coatings can act as ice nuclei (IN). For the first time we present field evidence for the efficiency of different primary biological particles to act as GCCN and IN by identifying primary biological particles based on the SEM micrographs and observing the frequency of coatings acquired through wet processing for different particle types.