2.136 Primary Biological and Biomass Burning Aerosols at the Northern Slope of Mt. Everest, Central Himalayas.

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Abstract:

Organic aerosols from biomass burning and primary biological sources are ubiquitous in the Earth’s atmosphere. They affect the absorption and scattering of solar radiation, act as cloud condensation nuclei (CCN) and possibly influence ice and snow albedo in remote regions. Here we determined polar organic markers for biomass burning, plant debris and primary biological aerosols at a remote site (Qomolangma, 4276 m a.s.l.) of Mt. Everest, central Himalayas using a solvent extraction-BSTFA derivatization-GC/MS technique. Seasonal trends of biomass-burning aerosols are characterized by pronounced maxima in the pre-monsoon season and minima in the summer monsoon period, being consistent with aerosol organic carbon. However, concentrations of fungal spore tracers and pland debris peaked in both pre-monsoon and post-monsoon seasons, suggesting that primary bioaerosols and plant emission are important sources of organic aerosols over the Tibetan Plateau in the post-monsoon season when biomass burning emission is weak. With the consideration of primary bioaerosol particles as pontetial CCN and atmospheric ice nuclei and biomass burning as one of the significant sources of light-absorbing

aerosols, our findings have potential implication for climate change in the Tibetan Plateau, a major concern in the Earth’s “Third Pole”.