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- Title and Author Search

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Production

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## Low molecular weight organic acids in aerosol particles from Rondônia, Brazil, during the biomass-burning, transition and wet periods

A. H. Falkovich<sup>1</sup>, E. R. Graber<sup>1,4</sup>, G. Schkolnik<sup>1</sup>, Y. Rudich<sup>1</sup>,  
W. Maenhaut<sup>2</sup>, and P. Artaxo<sup>3</sup>

<sup>1</sup>Department of Environmental Sciences, Weizmann Institute, Rehovot 76100, Israel

<sup>2</sup>Department of Analytical Chemistry, Institute for Nuclear Sciences, Ghent University, Proeftuinstraat 86, B-9000 Gent, Belgium

<sup>3</sup>Institute of Physics, University of São Paulo (IFUSP), Rua do Matão, Travessa R, 187, CEP 05508-900 São Paulo, Brazil

<sup>4</sup>Permanent affiliation: Institute of Soil, Water and Environmental Sciences, The Volcani Center, ARO, Bet Dagan 50250, Israel

**Abstract.** Particles from biomass burning and regional haze were sampled in Rondônia, Brazil, during dry, transition and wet periods from September to November 2002, as part of the LBA-SMOCC (Large-Scale Biosphere-Atmosphere Experiment in Amazonia – Smoke, Aerosols, Clouds, Rainfall, and Climate) field campaign. Water soluble organic and inorganic compounds in bulk (High Volume and Stacked Filter Unit sampler) and size-resolved (Micro Orifice Uniform Deposit Impactor – MOUDI) smoke samples were determined by ion chromatography. It was found that low molecular weight polar organic acids account for a significant fraction of the water soluble organic carbon (WSOC) in biomass burning aerosols ( $C_2$ - $C_6$  dicarboxylic acids reached up to 3.7% and one-ring aromatic acids reached up to 2% of fine fraction WSOC during burning period). Short dicarboxylic ( $C_2$ - $C_6$ ) acids are dominated by oxalic acid followed by malonic and succinic acids. The largest ionic species is ammonium sulfate (60–70% of ionic mass). It was found that most of the ionic mass is concentrated in submicrometer-sized particles. Based on the size distribution and correlations with  $K^+$ , a known biomass burning tracer, it is suggested that many of the organic acids are directly emitted by vegetation fires. Concentrations of dicarboxylic acids in the front and back filters of high volume sampler were determined. Based on these measurements, it was concluded that in the neutral or slightly basic smoke particles typical of this region, dicarboxylic acids are mostly confined to the particulate phase. Finally, it is shown that the distribution of water soluble species shifts to larger aerosol sizes as the aerosol population ages and mixes with other aerosol types in the atmosphere.

[Final Revised Paper](#) (PDF, 497 KB) [Discussion Paper](#) (ACPD)

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