

Interactive comment on “Methane production from mixed tropical savanna and forest vegetation in Venezuela” by P. J. Crutzen et al.

J. Kesselmeier

jks@mpch-mainz.mpg.de

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The authors discuss their old data sets in the light of the recent findings by Keppler et al. (2006) who reported about methane emissions from plants. I am glad to see experimental support regarding vegetation as a methane source under aerobic conditions. This discussion is fascinating. It has been clearly demonstrated that wetlands such as rice paddies for example release methane which is produced by methanogenic bacteria in the soil under anaerobic conditions but piped into the air by the plant tissues. It was always stated that plants do not contribute to the methane emission by production. However, I have some concerns regarding the way how rice plants were investigated by static chambers. They were enclosed for quite long times over the day

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and I often missed any data on the atmospheric CO₂ levels inside the static enclosures. Low CO₂ levels caused by CO₂ assimilation in the light may lead to stress for the rice plants which open their stomata as induced by the CO₂ signal. Hence, the plants may react unphysiologically and suffer from water loss. Though also using static chambers, Keppler et al. tried to avoid this stress by carefully checking the CO₂ levels and clearly demonstrated a methane production by plants. I think I can trust these data and believe the methane emission from vegetation is real. The hot discussion is of course how to upscale. The first attempt as published by Keppler et al. gives a large uncertainty and there are good reasons to expect emission estimates at the lower end, which is still significant enough. The data interpretation as given by Crutzen et al. in their paper supports such estimates though with high uncertainties due to a potential underestimation by missing dry season data as well as a crude estimation of mass balances related to a low boundary layer if I understood right. Both problems might indicate an even larger number to be estimated. Would that still be reasonable? I am curious about more reports and new results confirming, restricting or rejecting the new methane hypothesis. We need more data and new data interpretation in the light of the new findings. Biogenic emissions contribute significantly to the chemistry and physics of the natural atmosphere and should not be taken to qualify trees as polluters but carefully taken into account.

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