



Disturbance and vegetation properties affect soil biogenic nitric oxide emissions from an arid Kalahari Savanna

G.T. Feig, F.X. Meixner

Max Planck Institute for Chemistry, Biogeochemistry Department, Mainz, Germany
(feig@mpch-mainz.mpg.de / P.O. Box 3060, Mainz D-55020, Germany / Fax:
+49-6131-305-579 / Phone +49-6131-305-583)

Nitrification and denitrification processes in the soil provide an important source of nitric oxide for the atmosphere, particularly in non-industrialized regions. Arid and semi-arid ecosystems are thought to be an important contributor to the global biogenic nitric oxide budget; however there have been very few measurements in these ecosystems. Soil and vegetation processes are also known to exert an influence on the biogenic emission of nitric oxide from the soil. For this study, we used a laboratory incubation technique to measure the nitric oxide flux from soil. Corresponding soil samples have been obtained in four Kalahari vegetation types, differing in levels of disturbance or soil type (Perennial Grassland, Annual Grassland, Bush Encroached, Pan), and four vegetation cover types within each of the vegetation types (under tree canopy, under grass canopy, open, soil crust). The highest NO emissions occurred in the least disturbed ecosystem, the perennial grassland. Within each ecosystem the highest emissions occurred in soil obtained from under the tree canopy. This study shows that changes in vegetation structure, due to management practice or soil properties may have a considerable impact on the biogenic emission of important trace gases into the atmosphere.