Recovery of the Nitrogen Cycling Bacterial Community in Soils Following the Cerro Grande Fire in New Mexico

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The Cerro Grande Fire that burned 50,000 acres of forest surrounding Los Alamos, NM in early May 2000, and created regions of badly burned, moderately burned, and unburned soils. To investigate the community recovery of nitrogen cycling bacteria in soil following burns of different heat intensities, samples were taken to a depth of 10 cm, from four plots within each burn treatment type at one month, three months, five months, and 14 months after the fire. DNA was extracted from samples using a bead-mill homogenization technique, and was quantified. The total amount of DNA increased during the three-month time point in all samples, possibly due to seasonal precipitation. Unburned soils usually contained more extractable DNA, while moderately and badly burned soils had comparable amounts of extractable DNA. Using primers specific for the *amoA* (ammonia-oxidizing bacteria) and the *nifH* (nitrogen fixing bacteria) genes, nested PCR results showed a general trend of fewer samples with amplifiable *amoA* (54%) from the one and three month time-points in. Nitrogen fixers showed a strong presence (88% based on amplifiable *nifH*) during this same time period. The number of samples from which *amoA* could be amplified increased to 91% and 92% at five and 14 months respectively, while the number of samples from which *nifH* could be amplified remained relatively constant at five and 14 months. *amoA* PCR products were digested with TaqI for TRF analysis. Resultant patterns showed the presence of one peak suggesting that the dominant population consists of *Nitrosospira* spp. These preliminary results suggest that nitrogen cycling bacterial populations respond to fire disturbance differently.