Geophysical Research Abstracts
Vol. 19, EGU2017-309, 2017
EGU General Assembly 2017
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# Nitrogen addition improve the aboveground biomass, conversely, micro community was more sensitive to phosphorus addition in the Tibetan Plateau

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The Tibetan Plateau is one of the most sensitive and vulnerable ecosystem in the world. It has multiplicate important functions, e.g. reservoir for water and regulating climate change, biodiversity etc. Due to anthropogenic activities and climate change, there has been a part of degraded alpine grasslands gradually. To restore the degraded grassland, we have manipulated fencing plots in Baingoin County and designed plots with randomized block with 5 duplications in July 2013 in the Tibetan Plateau steppe. Nitrogen ($N_0$: 0; $N_1$: 7.5 g.N $m^{-2}.yr^{-1}$; $N_2$: 15 g.N $m^{-2}.yr^{-1}$) & phosphate ($P_0$: 0; $P_1$: 7.5 g.$P_2O_5$ $m^{-2}.yr^{-1}$; $P_2$: 15 g.$P_2O_5$ $m^{-2}.yr^{-1}$; $P_3$: 30 g.$P_2O_5$ $m^{-2}.yr^{-1}$) were applied with 12 treatments. In September 2014, we sampled the aboveground biomass and soils. The results showed (1) with the increasing of N addition rate, the biomass of Gramineae and total aboveground biomass showed increasion (*Gramineae*: $t^2$=0.218, highly significant; total: $t^2$=0.199, highly significant). For different rate of P addition, only total biomass showed significantly linear correlation with P rate ($r^2$=0.101, significant). (2) by chooseing $N_0$, $N_1$, $N_2$, $P_0$, $P_1$, $P_2$ and their interactions, we found opposing effects of nitrogen versus phosphorus additions on total phosphorus fatty acid (PLFAs), bacteria, gram positive (G+) and gram negative (G-). N addition could decrease them, while P addition increased them. (3) There was positive relation between bacterial biomass, G- and phosphorus content of plant; positive relation between nitrogen content of plant and G+: G-. (4) There was highly significant correlation between *Gramineae* biomass and $NH_4^+$ -N in soil, and the pH could explain the variances of soil microbial community mostly.