

Activity of abundant and rare bacteria in the forehead of East Antarctica ice sheet

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Bacterial community had been studied in many Polar Regions through the high throughput sequencing method. However, how the community response to the ice sheet movement in the forehead is not clear yet. The gradient soil samples including the ice free and ice covered sites were sampled in the forehead of East Antarctica ice sheet. By employing the Miseq sequencing methods, 18000 high-quality sequences were gotten for each sample and the bacterial diversity was studied and compared between the gradient samples. The coefficient of variance between the five sites of abundant group was 0.886 which was higher than that of the top 20 rare group (0.159) significantly (unpaired t test, p-value<0.0001) suggesting that the abundant bacterial communities were more sensitive to the ice sheet change in the sheet forehead than rare bacteria did. The rare group acted more like seed bank to keep the community functionality in the forehead of sheet. The abundant aerobic heterotrophic bacteria belonging to Verrucomicrobia were affected by ice thickness (with pearson coefficient 0.9, p-value<0.05). The abundant bacteria from acidic wetlands or alkaliphilic bacteria were affected by pH (p-value<0.05). Given the fact that Antarctica environment was more sensitive to the global warming, the abundant bacterial community will change caused by ice sheet movements including the recession and advancement but the whole community functionality can be guaranteed by highly diverse rare group here.