

The spatio-temporal distribution of bacterial communities in the plateau river and lakes

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Bacterioplankton play a key role in the migration and transformation of nitrogen and phosphorus in aquatic ecosystem. Therefore, understanding the community composition, seasonal variation and controlling environmental factors in the rivers and lakes is very important. Here, we studied bacterial community composition and seasonal diversity in the rivers, lakes and wetlands of Tibet. The results indicate that a total of 8448 OTUs were identified at 97% similarity based on 19776 reads for each sample, and the OTUs belonged to the 60 phylum, 152 classes, 301 order, 573 families and 1237 genera. The most common phyla identified were Proteobacteria, Bacteroidetes and Actinobacteria. The Shannon, Simpson and Chao indices were significantly different among the seasons in these rivers and lakes, and the bacterial community composition in rivers and lakes significantly varied among seasons based on analysis of similarity. Furthermore, analysis result indicated that the seasonal variation of bacterial community composition was more pronounced than habitats variation and the bacterial community was strongly correlated with water physicochemical properties ($p < 0.001$) rather than geographic distance. TN, TP, water temperature, pH are the main environmental factors affecting the spatiotemporal distribution of bacterial communities. Our result offers the first insights into the seasonal variation of bacterioplankton community of rivers and lakes in Tibetan Plateau.