

Pollen relevant source area and pollen productivity estimates and its potential use in Bashang steppe, northern China

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Pollen productivity estimates (PPEs) are indispensable prerequisites for quantitative vegetation reconstructions. PPEs has now been calculated in many different regions all over the world, however, there is a lack of continuous study in the same area. In this paper, the relevant source area of pollen (RSAP) and PPEs for common taxa in Bashang steppe($114^{\circ}10' - 116^{\circ}10'E$, $41^{\circ}10' - 42^{\circ}50'N$) were done with 3 Extended R-Value (ERV) models using ERV Analysis.v1.3.0 exe: Pollen sampling was performed at 30 random sampling sites selected by random function in 2013 and 30 sites selected along the roads in 2014. Vegetation survey followed the standard vegetation survey method promoted by “Crackles Bequest Project” and top soils are used for the pollen identification. The pollen analysis results showed the herbaceous taxa such as *Artemisia*, *Chenopodiaceae*, *Poaceae*, *Asteraceae* and *Cyperaceae* were dominated in pollen assemblages basically consistent with the composition of steppe vegetation, and there was little difference from year to year. However, for some taxa, there was still some difference. So we calculated RASP and PPEs to calibrate the relationship between pollen and vegetation. The RSAP was between 2000-3000m in Bashang steppe based on ERV sub-model 3 with Prentice's distance-weighting method in 2013 and 2014, being proportional to the openness of environment and the uniformity of communities. Integrating the results of two years, the PPEs for *Artemisia* and *Chenopodiaceae* both were nearly 20; the PPE for *Asteraceae* was nearly 8; the PPE for *Allium* was close to 2; the PPE for *Fabaceae* was between 0.2 to 0.5 restricted by insect pollination; the PPE for *Cyperaceae* changed a lot and was not reliable. Therefore, there is still a good consistency for PPEs in two years, the strategy of selecting sampling points and the inter-annual variability of local climate could also change RSAP and PPEs, however, the effect on the latter is little. Then we try to use the PPEs results to reconstruction the vegetation composition in Angulinao Lake since 5000aBP.