ABSTRACT BOOK II

IBC 2017
XIX International Botanical Congress
Shenzhen China

Posters and Abstracts

XIX International Botanical Congress
Shenzhen Convention & Exhibition Center
July 23-29, 2017

Nomenclature Section
Peking University HSBC Business School
July 17-21, 2017

that the decision makers and urban designers should recognize the integral role of cities in driving the composition and distribution of plant diversity in future urban planning and investment

T3
P0922

Environmental divergence and difference of stomatal characteristics among mainly *Picea* species in China

Minghao Wang, *Changming Zhao*
Lanzhou University

Ecological speciation played a prominent role in speciation and reflected as closely related species developed both environmental vicariance and morphological differences. But previous analysis of ecological speciation seldom took phenotypic data into account. With an example from Chinese mainly *Picea* species, we collected their geolocation and built phylogenetic tree, used SEEVA to test the correlations between the ecological divergences and the phylogenetic splits. And then, we discussed the differentiation of stomatal characteristics by leaf anatomy and the relationship between stomatal features and environment divergences for *Picea* species in China. The result indicated that temperature variables (maximum temperature of warmest month and temperature annual range) splited at basal nodes, precipitation variables (annual precipitation and precipitation of driest quarter) splited at terminal nodes following the uplift of Qinghai-Tibet Plateau. Linear stomatal densities (LSD), number of stomatal rows (N), pore depth (L) and mean maximum stomatal theoretical area (S_{max}) of species displayed significant difference on both surfaces in common garden. LSD was positively correlated with N on both two surfaces. Furthermore, relationship between stomatal characteristics and annual precipitation of *P. crassifolia, P. meyeri, P. asperata* and *P. koraiensis* reflected select pressure of stomata that species diverged to drier environment with higher stomatal density and smaller stomata. These results might imply that the climate influnce of QTP uplift could explain the ecological divergence of species during this geological time. Stomatal characteristics might be selected by environment variables at least in *Picea*.

T3
P0923

Accumulation of heavy metals in current-year old needles of *Pinus tabuliformis* Carrière. and *Pinus bungeana* Zucc. in different atmospheric environment

Runxi Wang, *Xin Wang, Hongrui Wu, Lihong Zu, Fuchen Shi*
College of Life Sciences, Nankai University

Heavy metals in different atmospheric environment had adverse impact on green-plants growing in varying degrees. In this study, the concentrations of Cu, Mn, Zn and Cd in current-year old needles of *Pinus tabuliformis* Carrière. and *Pinus bungeana* Zucc. that are widely planted in northern China, were determined. The resistance indexes: malonic aldehyde (MDA), soluble protein, soluble sugar, and free proline levels were also determined. The Pearson coefficients between the resistance indexes and the concentrations of heavy metals were analyzed to compare the abilities of two plants to accumulate heavy metals and their resistance characteristics. The topsoil and unwashed and washed needles were from urban, suburban and rural sites in Tianjin where the atmospherc conditions are significantly different according to the environmental monitoring results. The results indicated that there is a significant trend among the concentrations of heavy metals in current-year old needles and topsoil as follows: urban areas > suburban areas > rural areas ($P < 0.05$). In urban areas, the Mn concentration in *P. tabuliformis* and *P. bungeana* were as high as 122.72 $mg \cdot kg^{-1}$ and 128.91 $mg \cdot kg^{-1}$ which were almost as 20 times as in rural areas. Compared with *P. tabuliformis*, the accumulation of Mn and Zn were higher in *P. bungeana*, but as to Cu and Cd no significant differences were found between the two species. Pearson correlation coefficients among the absorption of Cu, Mn, Zn and Cd in needles are at quite a high level ($P < 0.01$). The concentrations of heavy metals in the unwashed needles were higher than that in the washed needles in the urban and suburban sites, which indicated that the surface of the needles could adsorb many heavy metals. The MDA, soluble protein, soluble sugar, and free proline contents increased as the concentrations of heavy metal rose along the rural-urban gradient, and were highly correlated with the concentrations of plant heavy metal in both *P. tabuliformis* and *P. bungeana*. In conclusion, high concentrations of Cu, Mn, Zn and Cd in aerial parts were mostly a consequence of atmospheric deposition, though other factors could affect this accumulation in plants. *P. tabuliformis* and *P. bungeana* could absorb and accumulate heavy metals, mainly through increased physiological resistance to stress.

T3
P0924

NaCl improved the nutritional status in *Zygophyllum xanthoxylum* responding to drought compared with *Arabidopsis thaliana*

Wenying Wang, *Weiwei Chai, Changyu Zhao, Qing Ma, Suomin Wang*
State Key Laboratory of Grassland Agro-ecosystems, College of Pastoral Agriculture Science and Technology, Lanzhou University

Zygophyllum xanthoxylum is a salt-accumulating xerophytic species with excellent adaptability to adverse arid environments. Our previous studies showed that *Z. xanthoxylum* absorbed, from low-salinity soil, a great quantity of Na^+ that transported to leaves and efficiently compartmentalized into vacuoles as an osmoregulatory substance under arid field conditions. Further investigations revealed that *Z. xanthoxylum* responded to salt with increased growth and moreover, became more tolerant to drought in the presence of moderate salinity, with improved photosynthesis and water status, is a totally different strategy from the glycophytes. To further reveal the special mechanisms underlying how Na^+ accumulation stimulate the growth and improves the drought resistance of *Z. xanthoxylum*, in this work, the effects of NaCl on the nutritional status in *Z. xanthoxylum* subjected to osmotic stress were investigated compared to that in the typical glycophyte *Arabidopsis thaliana*. Results showed that compared with control, either 50 mM NaCl or osmotic stress (-0.5 MPa) significantly increased the Na^+ concentration in leaves and roots in *Z. xanthoxylum*; while 5 mM NaCl had no significant effect on the Na^+ concentration in *A. thaliana*, and osmotic stress significantly decreased the Na^+ concentration in shoots in *A. thaliana*. Under