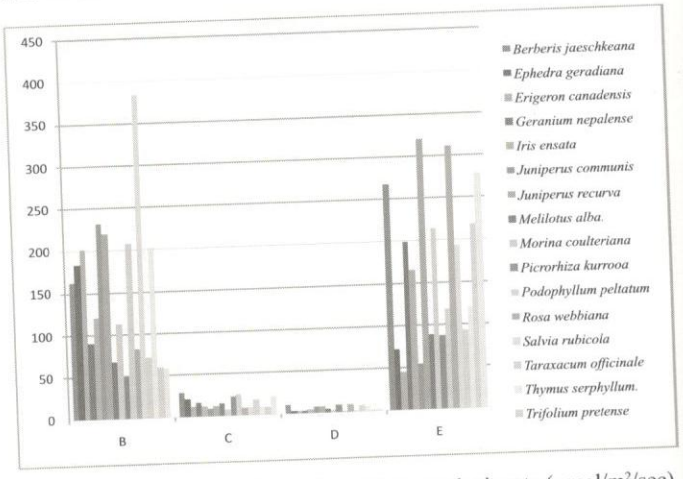
Simmilar results were obtained by Carlo *et al.* (2005), they observed that even after a long period of exposure to elevated CO_2 concentration *Populus x euramericana* did not show clear signs of photosynthetic acclimation. Kenzo *et al.* (2006) investigated variations in leaf photosynthetic, morphological and biochemical properties with increasing plant height and observed that photosynthetic properties, such as photosynthetic capacity at light saturation, light compensation point, maximum rate of carboxylation and maximum rate of photosynthetic electron transport, all increased significantly with tree height. Nogues *et al.* (1998) reported that UV-B radiation resulted in a decrease of adaxial stomatal conductance by approximately 65 per cent, increasing stomatal limitation of CO_2 uptake by 10 to 15 per cent. Fabio *et al.* (2001) also found that on area basis, actual photosynthesis varied from 5.0 up to 26.3 µmol CO_2/ m^2/s. Yuzhi *et al.* (2011) found that the net photosynthetic rate and the photosynthetic parameters Vcmax and Jmax were higher for leaves from plants grown at the high altitude than for those at the low altitude. The CO_2 and air temperature at the high altitude were lower than those at the low altitude. As a consequence, plants exposed to lower CO_2 partial pressure and lower air temperature has a higher photosynthetic capacity on the Tibetan Plateau. For water use efficiency the maximum value was depicted by *Salix alba* (0.00465) and least (0.00261) was found in case of *Hippophae rhamnoides* (Fig.5).

Blum (2005), found that under most dryland situations where crops depend on unpredictable seasonal rainfall, the maximisation of soil moisture use is a crucial component of drought resistance (avoidance), which is generally expressed in lower WUE. WUE was highest in ecosystems dominated by deciduous trees. Tanaka (2007), examined that quinone electron acceptor (QA) reduction rate exceeded the QA oxidation rate at low temperatures. The majority of QA remained reduced even when winter needles were subjected to a temperature of –5°C at low irradiance. Tissue *et al.* (1996) in similar study found that elevated CO_2 will enhance photosynthesis and biomass accumulation in Loblolly pine seedlings under high nutrient conditions; however, reductions over time in the relative biomass response of plants to elevated CO_2 complicate predictions of the eventual magnitude of carbon storage in this species under future CO_2 conditions. Droppelmann *et al.* (2000), found that tree pruning decreased water uptake compared to non-pruned trees. They found that Intercropping and high tree density increased water use efficiency.

Photosynthetic Activities and Water use Efficiency of Plants in Alpine Pasture Ecosystem

Photosynthetic efficiency of shrubs and herbs growing in alpine pasture was estimated and data pooled under clear morning conditions revealed that for various herbaceous and shrub species it was observed that the CO_2 intake was from 49.71µmol/m^2/sec in *Picrorhiza kurrooa* to 382.79µmol/m^2/sec in *Salvia rubicola*, photosynthetic activity rate ranged between 6.83µmol/m^2/sec in *Morina coulteriana* to 28.93µmol/m^2/sec in *Berberis jaeschkeana;* the transpiration rate was maximum of 9.78µmol/m^2/sec in *Berberis jaeschkeana* and minimum of 1.63µmol/m^2/sec in *Trifolium pretense;* stomatal conductance was found to range between 45.81µmol/m^2/sec in *Erigeron canadensis* to 311.78µmol/m^2/sec in *Rosa webbiana* (Fig.6). For water use efficiency the maximum value was depicted by *Podophyllum peltatum* (0.014534) and least (0.001118) was found in case of *Juniperus communis* (Fig.7).

Kulmala *et al.* (2009) in their study, measured photosynthesis separately for different species namely Heather (*Calluna vulgaris*), Rosebay willowherb (*Epilobium angustifolium*), Wavy hair grass (*Deschampsia flexuosa*) and Raspberry (*Rubus idaeus*) in the growing season of 2005 using a manual chamber. They observed that species specific rates of photosynthesis at ground level are rather similar regardless of the plant size. Brouder *et al.* (2008) found that elevated atmospheric CO_2 will increase leaf and canopy photosynthesis, especially in C_3



B= CO_2 intake (µmol/m^2/sec), C= Photosynthetic rate (µmol/m^2/sec)
D= Transpiration (µmol/m^2/sec), E= Stomatal conductance (µmol/m^2/sec)

Fig. 6. Mean Values of Photosynthetic Activities of Species Growing in Alpine

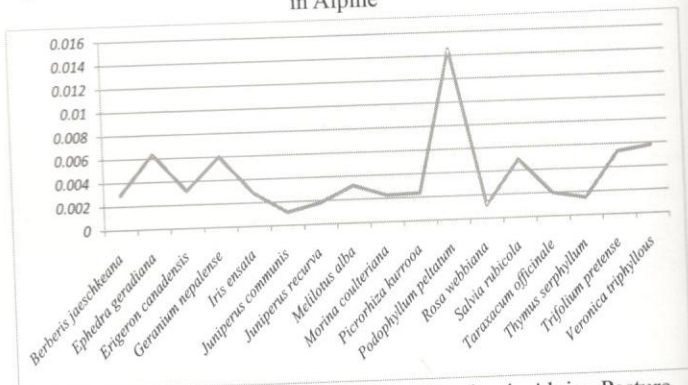


Fig. 7. Water Use Efficiency of Species Growing in Alpine Pasture Ecosystem.