Effect of Chilling Stress on Photosynthesis in Cucumber

The effect of chilling stress on photosynthesis of cucumber was studied. After treating whole plants at 4°C for variable time, the photosynthetic activity was monitored, using leaf discs, by the simultaneous measurement of O₂ evolution and fluorescence. Photosynthesis was greatly reduced after chilling for 4 hr in light (50 μmol/m²/sec) or for 24 hr in the dark. To identify affected sites by chilling stress, isolated chloroplasts were obtained from chilled (4 hr in light or 24 hr in the dark) plants. Chloroplasts isolated from chilled plants had lower photosynthetic activity than those from control plants, when measured by CO₂ fixation or O₂ evolution, indicating that photosynthetic apparatus was harmed. Results with reconstituted chloroplasts showed that thylakoids isolated from light-chilled plants were damaged while thylakoids from dark-chilled plants were not. In addition, NADP reduction was decreased by more than 50% in thylakoids from light-chilled plants, indicating electron transport chain has been harmed by chilling treatment in the light. However, NADP reduction was not affected by dark-chilling.

The Levels of Taxol and Related Taxanes in the Korean Native Yews (Taxus cuspidata)

The levels of taxol, the most promising chemotherapeutic agent for ovarian cancer, and related compounds in the bark and needle of Taxus cuspidata grown in Mt. Jiri (J), Mt. Soback (S) and Cheju Island (C), and T. cuspidata var. latifolia in Ullung Island (U) were determined by HPLC. The taxol in the needle was confirmed by electrospray MS. The taxane content significantly varied with the location and plant part. The average taxol content in the bark of J and S was comparable to that (0.02%) of Pacific yew (T. brevifolia) reported, whereas that of C and U was markedly at a lower level. Surprisingly, the needle of native yews in C and U contained a much higher level of taxol, 0.022% and 0.017% on the basis of dry wt, respectively than that of J and S. Particularly, the needle of trees grown in the coastal region contained much higher level of taxol than that in mountain locations even within C and U, indicating that the taxane level is affected by environmental factors. These results suggest that the needle of natural yew habitats in C and U may be used for a rich and renewable source of taxol.