

**Effect of Water Stress on Photosynthesis between Varieties
of *Panax ginseng* C.A. Meyer**

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Objectives

Panax ginseng C.A. Meyer as a kind of semi-shade perennial plant is cultivated in shading installation with a drought environment during the whole growth stage. So, in the present study, two varieties of *Panax ginseng* were selected to survey the different drought resistance through the change of photosynthesis characteristic under different water stress artificially.

Materials and Methods

○ Materials

2-year-old *Panax ginseng* Cheonpung and Yeonpung were planted in the shelter house with the ginseng bed soil for large pot.

○ Methods

Water supply was cut off in August and the control group soil water content was kept at 26.0-27.0. Photosynthetic rate, stomatal conductance, transpiration rate by portable photosynthesis measuring instrument (LI-6400) and SPAD were investigated every week at 5/8, 12/8, 19/8 and 26/8.

Results

It is shown that with the deepening of water stress, both photosynthetic rate decreased, but distinctly at 19/8 on Cheonpung at $2.63 \mu\text{molCO}_2\text{m}^{-2}\text{s}^{-1}$ and diversely on Yeonpung with the distinct decrease to $1.19 \mu\text{molCO}_2\text{m}^{-2}\text{s}^{-1}$ at 26/8, no significant difference to Cheonpung. The same tendency are shown on SPAD and stomatal conductance which decreased with the deepening of water stress but less on Yeonpung compared to Cheonpung. Transpiration rate of Cheonpung in control group is higher at $0.76 \text{molH}_2\text{Om}^{-2}\text{s}^{-1}$ than Yeonpung at $0.58 \text{molH}_2\text{Om}^{-2}\text{s}^{-1}$, but decrease sharper to 0.55 and $0.27 \text{molH}_2\text{Om}^{-2}\text{s}^{-1}$ at 12/8 and 26/8, while a distinct decrease on Yeonpung at 26/8. Cheonpung is more sensitive to water stress than Yeonpung at mild and medium water stress, but both are hurt seriously at severe water stress.

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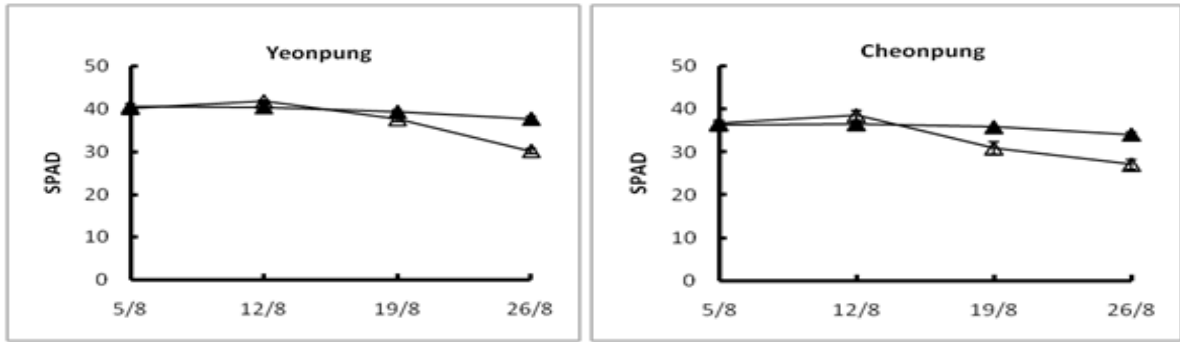


Fig.1. Changes of SPAD according to different soil water contents. (▲:Control,△:Water stress).

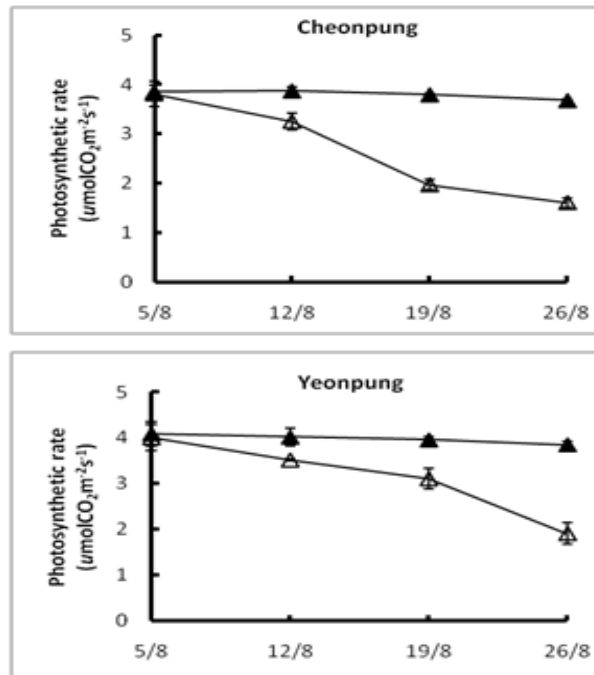
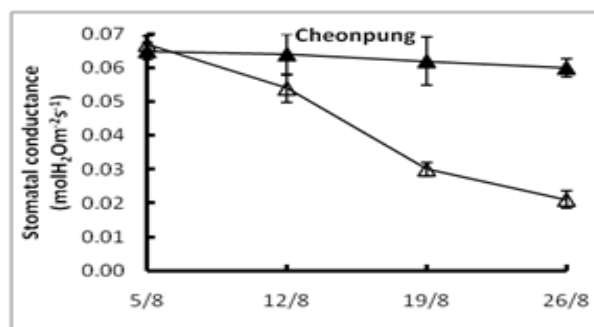


Fig.2. Changes of photosynthetic rate according to different soil water contents. (▲:Control,△:Water stress).



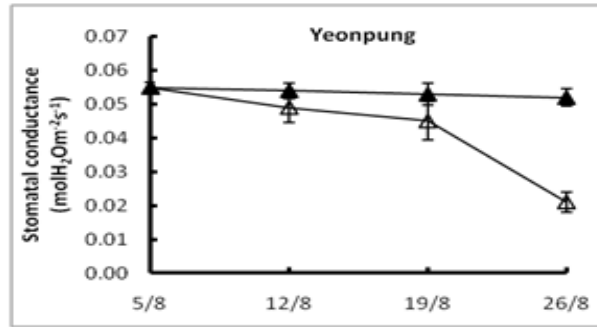


Fig.3. Changes of stomatal conductance according to different soil water contents. (▲:Control,△:Water stress).

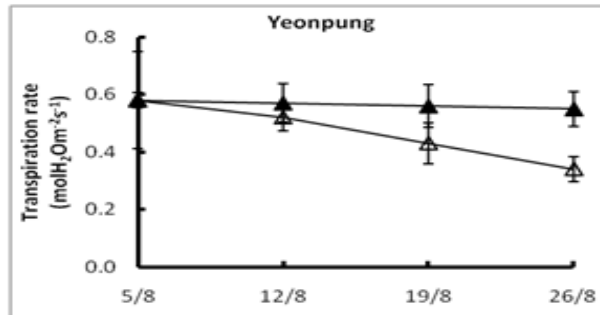
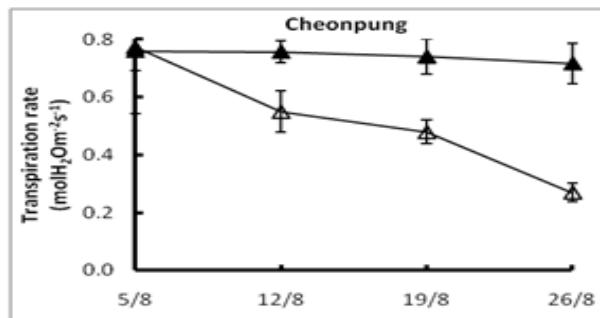


Fig.4. Changes of transpiration rate according to different soil water contents. (▲:Control,△:Water stress).