

PARTHENOLIDE AND ABSCISIC ACID SYNTHESIS IN FEVERFEW ARE CONNECTED

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ABSTRACT

Feverfew plants under different environmental conditions and plants and cut flowers treated with chemical agents that affect abscisic acid (ABA) synthesis were evaluated for parthenolide (PRT) and ABA. PRT levels were highest during late afternoon whereas ABA was at its maximum level during morning hours (data not shown). ABA was higher in water-stressed plants whereas PRT content was higher in plants recovered from dehydration (Fig. 1).

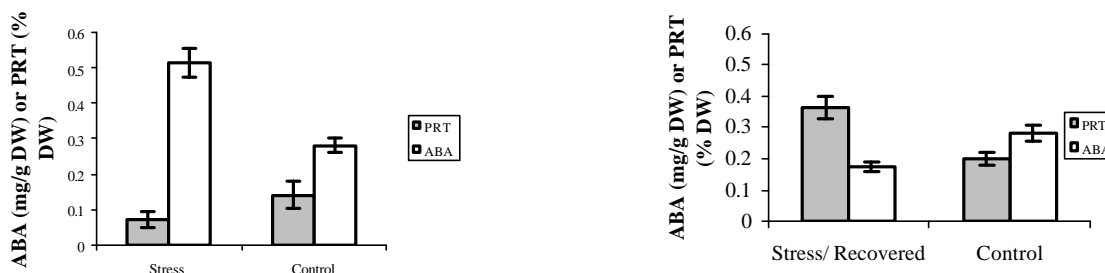


Fig. 1. Influence of water stress-recovery regime on the PRT and ABA concentration in feverfew. “Control” indicates daily-watered plants.

ABA inhibitors such as norflurazon, sodium tungstate, naproxen and sodium bisulfite were used to determine whether PRT and ABA biosynthesis are connected. Norflurazon and naproxen reduced PRT concentration in cut flowers (Fig. 2) and in two-month old plants (data not shown). Sodium bisulfite and sodium tungstate reduced PRT in cut flowers. Flowers treated with 2,4-D, a promoter of ABA synthesis, contained higher PRT concentration.

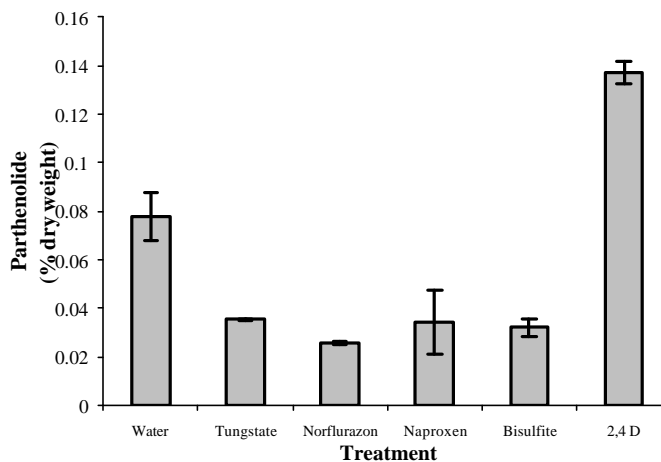


Fig. 2. The effect of ABA inhibitors and 2,4-D on parthenolide content in fresh cut flowers

Application of 2,4-D to potted plants resulted in a 2.5 fold increase in PRT levels (data not shown). This study demonstrated that PRT and ABA level are affected dissimilarly by environmental conditions. Our results with inhibiting and promoting agents indicate that PRT synthesis in feverfew is connected to the ABA pathway.

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