OBSERVATIONS ON ORANGE POD PEAS: WT 10 263

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Plants grown from seeds of line WT 10 26 3 kindly provided by W. K. Swiecicki (1) were observed throughout development under a 14-hr day at 15C in a Conviron growth cabinet. The plants, dwarf with short internodes, had stems of a normal green color in the upper internodes, but, by the time the eighth node (sixth true leaf) had appeared, an orangey cast was visible in the older internodes and in the petioles of the leaves. The orange color was associated with vascular tissue as could be seen in hand-cut cross sections, the color first appearing in the walls of the phloem sclerenchyma bundle caps. In the oldest internodes, the color was also evident to some extent in xylem cell walls and more prominently in the walls of the pith cells lying between the vascular bundles. As the plants flowered and began to bear fruit, normal green pods at first appeared, then the orange cast resulting from a colored inner sclerenchyma tissue became evident. The peduncle of the fruit also was an orangey color with the color especially prominent in vascular sclerenchyma tissues, i.e. the orange color is associated with lignification.

Green stems from plants of WL 1754 and orange stems of WT 10 263 plants were extracted with acetone, and the extracts were partitioned into lipid soluble chloroplast pigments and water soluble flavonoids. Both fractions were subjected to thin layer chromatography on silica gel with the solvent systems hexane: diethy1 ether: acetone, 6 0:30:20, for chloroplast pigments, and ethyl acetate-methanol :water, 100:17.5:16.5, for flavonoids. Chloroplast pigments were identical in both types of extract, demonstrating that the orangey color is not a carotenoid. Flavonol pigments were also similar in a one-dimenaional run, except for the presence of a large blue fluorescing band in extracts of WT 10 263. A similar observation was made when extracts from the green upper internodes were compared with extracts from the orange older Internodes of the same WT 10 263 plant. The extracted residues of the orange tissues retained a yellow color which could be dissolved only with a 10% solution of K0H. Neutralization of the bright yellow alkaline solution with HC1 resulted in a fading of the color and the precipitation of an insoluble yellow substance. Attempts to identify the blue-fluorescing compound and the insoluble yellow substance are in progress.

1. Swiecicki, W. K. 1982. PNL 14:65.