

PLANT PHYSIOLOGY Lecture 15 - "Secondary" Metabolism

- I. Other types of metabolism
 - A. Amino acid metabolism (synthesis) and Urea cycle (degradation & recyclization)
 - 1. From pyruvate: alanine, valine, leucine
 - 2. From oxaloacetate: aspartate, asparagine, lysine, threonine, methionine, isoleucine
 - 3. From α -ketoglutarate: glutamate, glutamine, proline, arginine
 - 4. From 3-PGA: serine, cysteine, glycine
 - 5. From PEP & E4P: Phenylalanine, tyrosine, tryptophan
 - 6. From R5P: Histidine
 - B. Fatty acid metabolism & glyoxylate pathway
 - C. Chlorophyll biosynthesis
 - D. "Secondary" metabolism
- II. Perspective on secondary metabolism
 - A. "Secondary"????
 - 1. Meaning: not required for normal growth and development
 - 2. Categories of secondary compounds
 - a) Phenolics - examples: lignin, anthocyanin
 - b) Terpenoids - examples: carotene, xanthophyll, menthol
 - c) Alkaloids - examples: morphine, cocaine, nicotine
- III. Where the secondary products come from
 - A. Phenolics (and Flavonoids) - Shikimic Acid Pathway
 - B. Terpenoids - Mevalonic Acid Pathway
 - C. Alkaloids - From ornithine, aspartate, lysine, phenylalanine, tyrosine, tryptophan, etc.