Section 2 Abstracts: Physiology of the Chestnut Blight Fungus

Protoplast Fusion Between Compatible and Incompatible Strains of Cryphonectria parasitica. S. Pecchia, S. Fanti and G. Vannacci. Dipartimento di Coltivazione and Difesa delle Specie Legnose, Sez. Patologia Vegetale, Universita di Pisa, Pisa, ITALY

Fusion experiments were carried out between compatible and incompatible virulent strains of *Cryphonectria parasitica* using spontaneous mutants resistant to cobalt and PCNB as selectable markers. Drug-resistance did not affect spore formation and vegetative incompatibility reactions. Intrastrain fusion between two different drug-resistant mutants from a single strain and interstrain fusions between drug-resistant mutants from different compatible and incompatible strains were performed. Protoplasts from cobalt and PCNB resistant mutants were fused in a PEG solution containing CaC12, glycine and sucrose. Colonies from fused protoplasts were selected by their ability to grow in the presence of both cobalt and PCNB. Following all intra- and interstrain protoplast fusions, presumptive somatic hybrid colonies were obtained. They developed very slowly on selective medium and when transferred to non-selective medium their growth was faster and some colonies were sectored.

Screening American Chestnut Progeny for Blight Resistance. John Elkins,[1] Gary Griffin[2] and G.M. Farias[2]. [1]Division of Natural Sciences, Concord College, Athens, WV 24712; and [2]Department of Plant Pathology, Physiology and Weed Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061, USA

Large American chestnut trees (40-100 cm in diameter at breast height, dbh) that have survived blight infection since the original epidemic were tested for blight resistance by inoculating with a virulent strain of the blight fungus. Those trees producing small (7-12 cm in 1 yr vs up to 23 cm on a susceptible tree) and superficial cankers upon inoculation were propagated by grafting, and the grafted clones intercrossed by controlled pollinations. The progeny were grown to 5-10 cm dbh and inoculated. Several of the progeny with non-lethal, apparently superficial cankers 2 yr after inoculation appeared to have more resistance than their parents. The presence of large quantities of hamamelitannin in the bark of American chestnuts and the absence of this constituent in the bark of Chinese chestnuts may be used as a biochemical marker to screen for blight resistance at an early age in Chinese-American hybrids but not in trees with two American parents because the blight-resistant American chestnuts also contain hamamelitannin in large quantities. Hamamelitannin and other hydrolyzable tannins can serve as the sole carbon sources for growth of the blight fungus in culture, and may serve as important nutrient sources in the pathogenesis of the blight fungus in the tree. Growth of the blight fungus on hydrolyzable tannins requires production of the enzyme tannase. Tannase activity was greater when the blight fungus was grown on tannins (in aqueous extracts or purified tannin fractions) derived from bark of American chestnut than when it was grown on an equivalent amount of tannin from bark of Chinese chestnut. Further research is needed to determine whether production of tannase during growth of the blight fungus on chestnut bark extracts may be used as a tool to identify resistance in American progeny and Chinese-American hybrids.