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### Structural characterization and a cyto-molecular map of chestnut (*Castanea* spp.)

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The American chestnut (*Castanea dentata*,  $2n = 2x = 24$ ), once known as the “King of the Appalachian Forest”, has been nearly decimated by chestnut blight caused by a fungal pathogen (*Cryphonectria parasitica*) that was accidentally imported on nursery stock from Asia in the late 1800s. Efforts are being made to transfer the blight resistance gene(s) from Chinese chestnut (*C. mollissima*) into American chestnut through backcross breeding and genetic engineering. A number of genetic linkage maps have been reported and are being utilized to accelerate the breeding program through marker-assisted selection. Additionally, the chestnut is being sequenced to enable gene discovery efforts aimed at facilitating molecular breeding and/or genetic engineering. It is generally understood that plant genomes contain large amounts of repetitive DNA, which interferes with efficient physical map construction and genome assembly. To aid the assembly process we are using 16 to 20 genetically and physically mapped BAC clones as probes from each of the 12 linkage groups (LGs) in fluorescence *in situ* hybridization (FISH). A full structural characterization of the LG\_B chromosome of Chinese chestnut has been completed using 20 BAC clones, and all the BACs are found to be hybridized LG\_B specific chromosome. The same analysis is being completed for LG\_E to evaluate a long-standing hypothesis of a reciprocal translocation involving these chromosomes. In addition, we have assigned each of the 12 LGs to individual chromosomes of Chinese chestnut and a cyto-molecular map is being developed. The resultant map will be essential for completing the arrangement of the reference genome sequence and genes for chestnut. Details of our research results and further plans will be presented and discussed.

#### Biography

Islam-Faridi N has completed his PhD at the University of Cambridge, England, UK, 1988 and worked at the International Rice Research Institute and Intl. Maize and Wheat Research Institute, Mexico from 1989 to 1994 and then worked in the Department of Soil & Crop Sciences, Texas A&M University until 2003 before joining the USDA Forest Service. He has been working in conventional and molecular plant cytogenetics for the last 25 years and published about 70 papers in reputed journals.

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