

DOES CELLULOSE HAVE A PROTEIN COMPONENT?**Allen K. Murray****Glycozyme Inc.****Irvine, CA****Robert L. Nichols****Cotton Incorporated****Cary, NC****Abstract**

During our investigation of the minor constituents of cellulose from cotton fibers, samples were subjected to repeated hydrolysis in 6N HCl. In addition to monosaccharides several oligosaccharides were also released. Investigation of the oligosaccharides suggested that they may have a peptide component since amino acids were found in the hydrolyzate. Several isolated oligosaccharide fractions were found to contain protein by the Lowry assay as did the 6N HCl hydrolyzate. The oligosaccharide fractions contain *s*-inositol, sorbitol, galactose, glucose and mannose as well as several amino acids. Since these fractions are isolated from a 6N HCl hydrolyzate it is not surprising that if a protein was present that only a small portion would not be completely degraded. Light microscopy of the particulate material in the 6N HCl hydrolyzate shows the apparent relative increase in crystalline material following treatment with chymotrypsin and proteinase K but not with trypsin. This may be due to the exposure of more crystalline cellulose by removal of protein. The particulate material does not stain readily with Coomassie blue, however, treatment with sodium metaperiodate changes the morphology and facilitates staining with Coomassie blue. These results suggest that there may be a protein component to cellulose. Since cellulose is synthesized in close association with microtubules and protein primers have been demonstrated for glycogen and starch, the question of a possible protein component of cellulose is intriguing.