E2-33: Structural features of cell-wall polysaccharides of mungbean *(Vigna radiata)*

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The cell walls of mungbean cotyledons were isolated and purified using improved methods which included the complete disruption of the tissue structure by wet ball-milling and the use of solvents, sodium dodecyl sulphate (SDS), phenol-acetic acid - water and aqueous dimethyl sulphoxide, which have a high affinity for intracellular compounds.

The component polysaccharides were sequentially extracted with minimum degradation in cyclohexane-trans-1, 2-diaminetetra- acetate (CDTA) at 20°C, 0.05 M Na_2CO_3 at 1°C and 20°C, 0.5 M and M KOH at 1°C and 4 M KOH at 20°C, and 4 M KOH + borate at 20°C to leave the α-cellulose, which contained significant amount of pectic material. The isolated polymers were fractionated by anion exchange chromatography and selected fractions were subjected to methylation analysis.

The results indicated that the bulk of the pectic polysaccharides were extracted in CDTA, Na_2CO_3 and in 0.5 M KOH. The pectic polysaccharides had branched rhamnogalaturonan backbone inferred from the presence of (1->2,4) and (1->2)-linked rhamnose residues. Some of the (1->4)-linked galacturonic acid residues were substituted on position 3, indicating that position 4 of the (1->2)-linked rhamnose residues are not the only points of attachments of the side chains. The presence of large amounts of (1->5)-linked Araf and T-Araf, indicated the presence of short "arabinan" side chains on the rhamnogalacturonan backbone. The Na_2CO_3 (20° C) extract contained appreciably more branched backbone with longer side chains.

KOH-soluble polymers contained significant amounts of highly branched xyloglucans associated with arabinose-rich pectic polysaccharides, small amounts of xylan and neutral arabinans showing heterogeneity in the various fractions.

The final wall residue contained α-cellulose residues with significant amounts of cross-linked pectic polysaccharides associated with it.