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POSTER PRESENTATIONS

Modifications in parenchyma cell wall structure related to stem twining in monocotyledonous liana *Dioscorea balcanica* Košanin

PP1-1

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Anatomical adaptation of liana plants includes structural changes in cell walls of different tissues: fibers, vessel elements and tracheids. The contribution of parenchyma cells to stem twining is mostly unknown. Plants control the orientation and alignment of cellulose fibrils during the deposition in the cell walls with high precision, creating required anisotropy of the cell wall. Our aim was to determine possible changes in cellulose fibrils orientation and structural order in stem parenchyma cell walls related to stem twinning in liana plants.

We applied different microscopy techniques: light microscopy, scanning electron microscopy and differential polarization laser scanning microscopy (DP-LSM) for fluorescence detected linear dichroism imaging (FDLD), on stem cross sections of straight and twisted internodes of monocotyledonous liana *Dioscorea balcanica*. Histochemical analysis showed no difference in parenchyma cell wall structure between straight and twisted internodes. Also, no difference in "cellulose fiber order" in parenchyma cell walls related to stem twining was found by FDLD microscopy. However, SEM micrographs suggested the difference in cellulose microfibril orientation in secondary cell walls of parenchyma cells related to stem twining.

Our results indicate that adaptations to stem twining in liana plants involve modifications in cellulose microfibril orientation in parenchyma cell walls. Although the orientation of cellulose microfibrils dictates, among other properties, cell shape, living stem parenchyma cells in *D. balcanica* retain their shape regardless of stem twining, which is possibly enabled by retaining "cellulose fibril order".

Keywords: cellulose, cell wall, parenchyma, *Dioscorea balcanica* Košanin.

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