

Water transport in plants – a highly efficient system under pressure

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A longstanding question in plant sciences is how plants are able to transport xylem sap. Most sap is transported under negative pressure without continuously developing large gas bubbles that reduce sap flow. Recent insights that contribute to our mechanistic understanding of water transport in plant xylem include: (i) improved methods to quantify embolism resistance, (ii) the porous medium characteristics of water conducting cells, especially the 3D-structure of interconduit pit membranes, and (iii) the occurrence of insoluble, amphiphilic lipids with a potent surface activity in sap. These findings support the occurrence of nanobubbles in xylem sap but are not in line with several longstanding concepts.

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