Design, synthesis and biological evaluation of Strigolactone and Strigolactam derivatives for potential Crop Enhancement applications in modern agriculture

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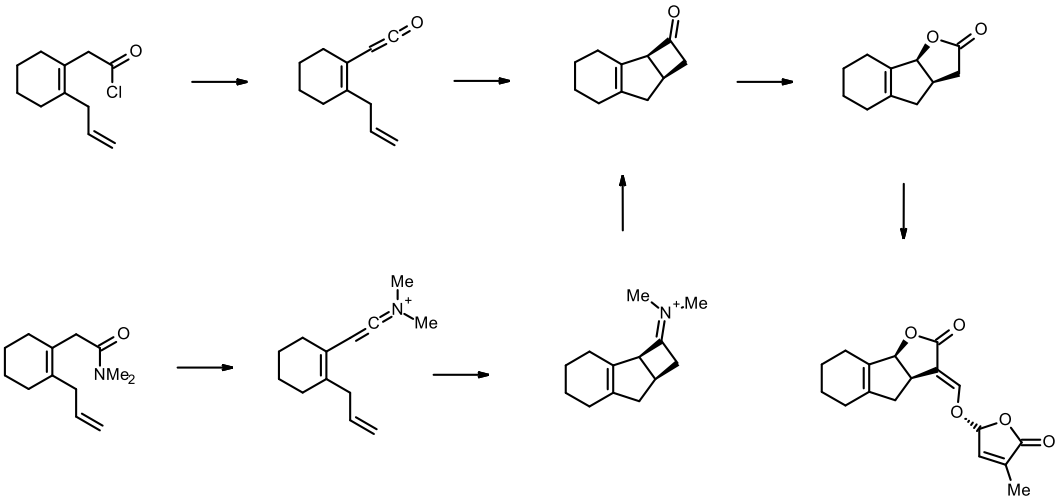
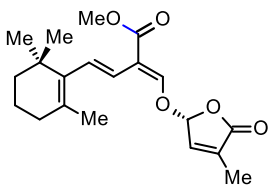
Strigolactones are the last discovered phytohormones. Among the numerous roles that strigolactones play in plant growth and development, they have been shown to control the root and shoot architecture, having significant consequences on plant adaptation to environmental conditions and abiotic stress. In addition, strigolactones signaling might influence the harvest yield of field crops.

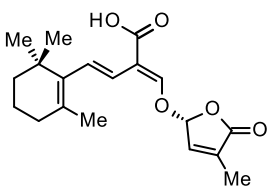
We describe the stereoselective synthesis of natural strigolactones as well as of their derivatives displaying improved biological performance using ketene-iminium salts as key intermediates. We disclose also the synthesis of non-canonical strigolactones as methyl carlactonoate and carlactonic acid. In addition, we illustrate the use of ketene-iminiums intermediates in other Crop Protection projects leading to small rings derivatives as well as to aromatic compounds.

Scheme





methyl-carlactonoate



carlactonoic acid