

Biosynthesis and signalling of ethylene and their regulation on seed germination and dormancy

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Abstract

Seed germination is a key ecological and agronomic trait, which is determined by both internal and external factors. These factors regulate the dormancy status and germination potential of seeds, playing a critical role in the subsequent growth, development, and production of plants. Ethylene, a simple gaseous phytohormone, multiple roles in regulation of metabolism at molecular, cellular, and whole-plant levels. It affects plant performance in both optimal and stressful environments by interacting with other signalling molecules. This work focus on the role of ethylene in seed germination and dormancy release, ethylene biosynthesis and signalling, and the interaction of ethylene with phytohormone abscisic acid and gibberellin. Furthermore, we preliminarily explored the mechanism of OsJMJ718, a histone demethylase gene, positively regulates seed germination in rice. These insights shed light on the molecular mechanisms by which ethylene regulates seed germination and dormancy.