

The transcriptomic and proteomic profile of symbiotic germination of *Dendrobium officinale* (Orchidaceae)

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Mycorrhizal fungi colonize orchid seeds and induce the germination. This so-called symbiotic germination is a critical developmental process in the lifecycle of all orchid species. However, little is known about the molecular changes taking place during seed germination, especially symbiotic germination. *Dendrobium officinale* is an endangered epiphytic orchid, which is widely used in traditional Chinese medicine in China. In previous studies, we have screened the fungi (*Tulasnella* sp.) promoting germination of *D. officinale* and examined the ultrastructural changes accompanying symbiotic germination. Here, our comparative transcriptomic and proteomic analysis between asymbiotic and symbiotic germination of *D. officinale* seed revealed fungal colonization of orchid seeds appears to induce higher and earlier expression of some key proteins involved in lipid and carbohydrate metabolism and thus improves the efficiency of utilization of stored substances present in the embryo. Phytohormone quantification revealed plant hormone accumulation in the protocorm of *D. officinale* infected fungi. Exogenous GA treatment or adding GA inhibitor can inhabit mycorrhizal formation and decrease seed germination rate in symbiotic germination assay. Therefore, we supposed that plant hormone involved the crosstalk signal pathway between hormone biosynthesis and common symbiotic signal pathway during seed symbiotic germination of *D. officinale*.