



Figure S1 Morphological characteristics of mycelium and ectomycorrhiza of *Lactarius deliciosus*. Different types of EM including double (Dichotomic, D), Quadruple (Q) and Cluster (C) with more than four branches formed in this study (bar = 1 mm).

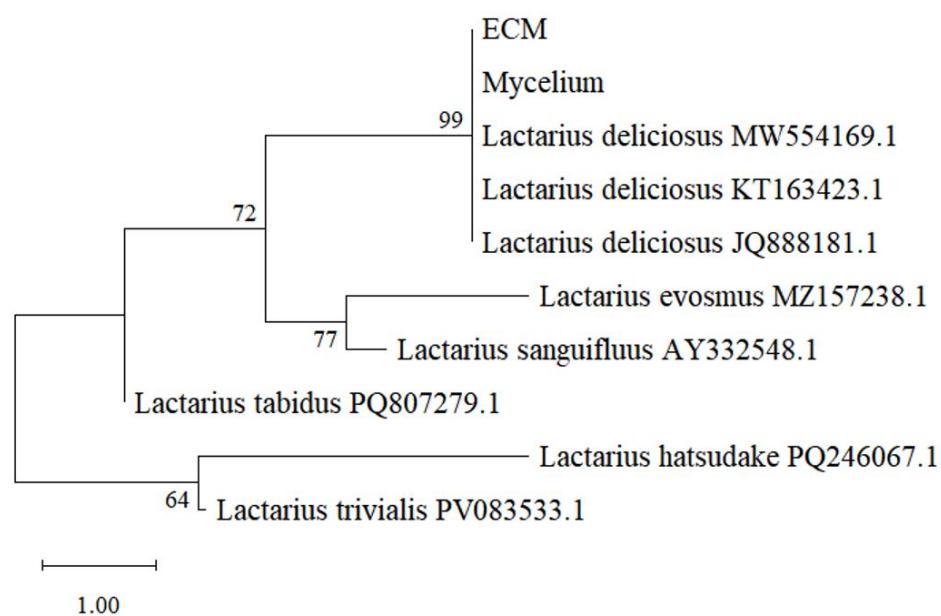


Figure S2 Phylogenetic tree based on ITS sequence matrix. ECM: ectomycorrhiza of *L. deliciosus*; Mycelium: *L. deliciosus* mycelium.

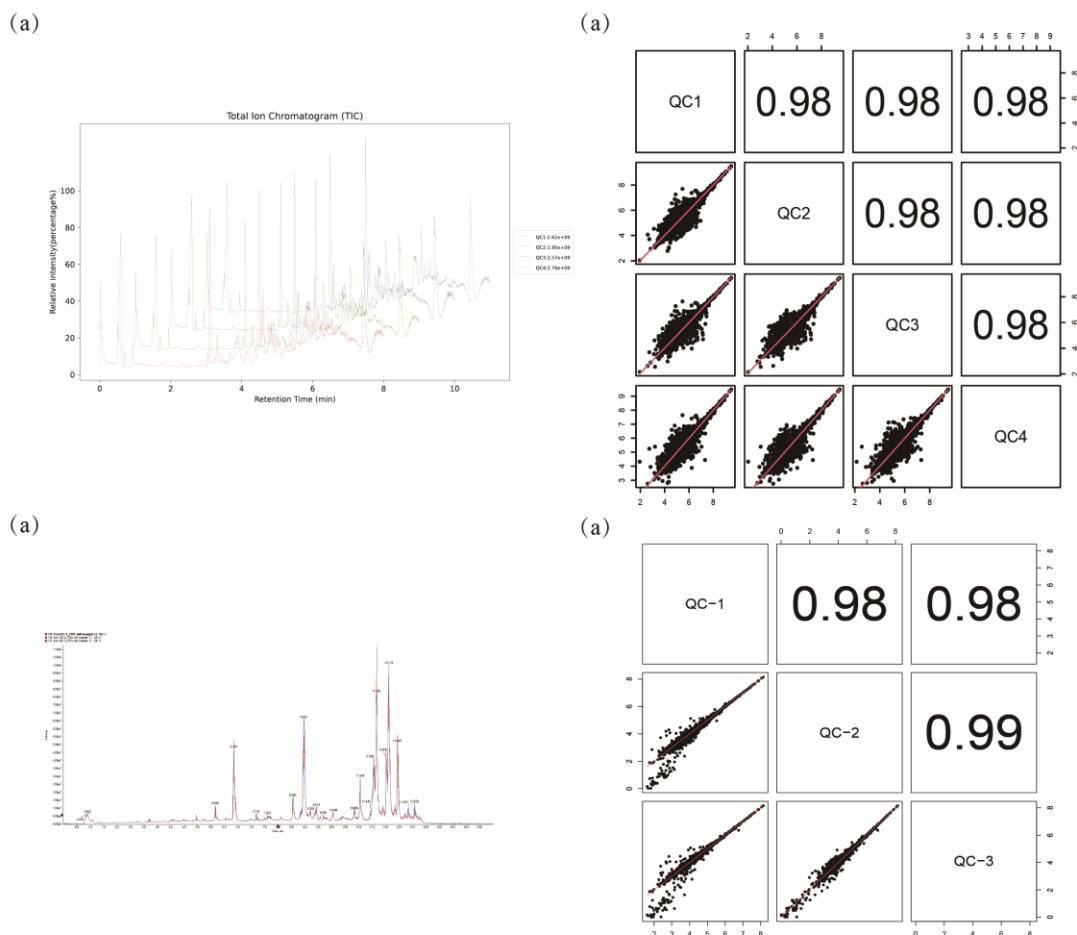


Figure S3 Comparison of QC mass spectrometry peak patterns and correlation analysis of QC.

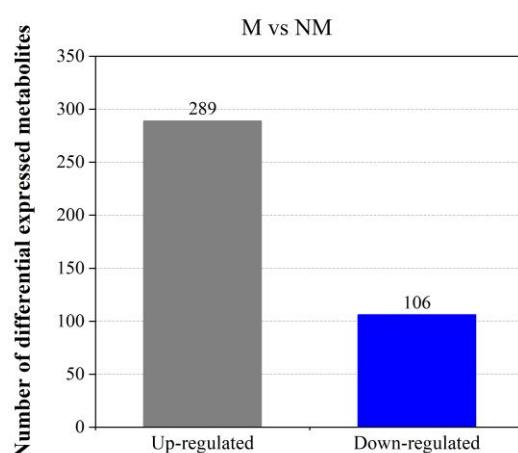


Figure S4 Differential expressed metabolites in root exudates of between mycorrhizal and non-mycorrhizal seedlings.

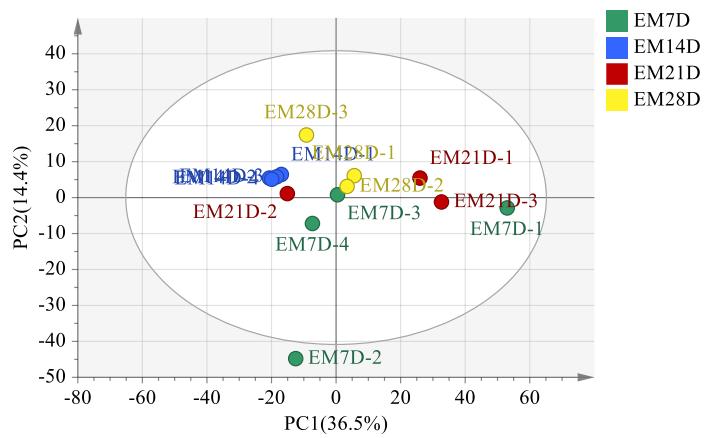


Figure S5 PCA score plot of metabolites in root exudates at different stages of EM development, under combined positive-negative ion mode.

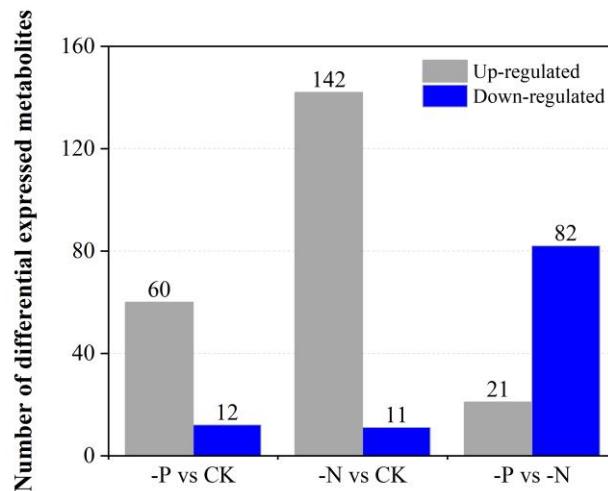


Figure S6 Up- and down-regulated metabolites in root exudates of *Pinus yunnanensis* seedlings under nitrogen-deficiency and phosphorus-deficiency conditions.