

Description of Additional Supplementary Files

File Name: Supplementary Data 1

Description: Metabolic products in mono-culture and co-culture of *R. erythropolis* and *P. aeruginosa* by single quadrupole Gas Chromatography-Mass Spectrometer (GC/MS). n = 3 biological replicates. "v" indicates the metabolic substances detected under the corresponding culture conditions. Rh: mono-culture of *R. erythropolis*, Ps: mono-culture of *P. aeruginosa*, RP: co-culture of the two strains, RT: retention time, SMILE Formula: Simplified molecular input line entry specification.

File Name: Supplementary Data 2

Description: Physicochemical properties of rhizosphere soil of red paddy soil in pot experiment and in field (n = 20 biological replicates). OM: Organic matter, AN: Ammonium nitrogen, AP: Available phosphorus, AK: Available potassium, TAl: Total aluminium.

File Name: Supplementary Data 3

Description: Primers of different gene amplification.

File Name: Supplementary Data 4

Description: Results of the evaluation of primers specific to present study generated by Primer premier 6.0.

File Name: Supplementary Data 5

Description: The nucleotide sequence information of the functional gene under investigation in this study.