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Organophosphorus-degrading bacterial community during composting from different sources and their roles in phosphorus transformation

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Abstract: The goals of this study were to identify the key culturable organophosphorus-degrading bacteria (OPDB) that contributed to regulating different phosphorus (P) fractions and evaluate the roles of OPDB and inorganic phosphate-solubilizing bacteria (IPSB) in P transformation during different composting. The results showed that the amounts, incidence and community composition of OPDB for composts from diverse sources were distinctly different but significantly related to temperature and organic matter content. Fifteen key OPDB correlated closely with different P fractions have been selected by redundancy analysis. Two structural equation models were established to compare the roles of OPDB and IPSB on P availability during composting. Variance partitioning further showed that the interactions between IPSB and OPDB communities had a greater impact on P transformation than each independent factor. Therefore, the combined regulation of IPSB and OPDB were suggested to control the transformation of P fractions during composting.

Keywords: Composting, Organophosphorus-degrading bacteria, Phosphorus fractions

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