

## عنوان مقاله:

Microbial consortium culture and vermi-composting technologies for recycling on-farm wastes and food production

## محل انتشار:

مجله بین المللی بازیافت مواد آلی در کشاورزی، دوره 7، شماره 2 (سال: 1397)

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## نویسندگان:

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## خلاصه مقاله:

Purpose A study was conducted to characterize the 'Madhyam culture' (Excel Crop Care Limited.), an aerobic-composting microbial consortium culture, and understand composting dynamics, product quality and use in crop production vis-à-vis vermi-composting (using earthworms). Methods ۱۶S rDNA analysis was used to characterize aerobic-composting culture. Aerobic-composting and vermi-composting technologies were evaluated to decompose sorghum straw and dung biomass (۸۰:۲۰ ratio; primed with ۰.۵% urea and ۴% rock phosphate) to study days to maturity and composting dynamics in terms of changes in temperature and microbial population. Compost quality was tested for macro-, micro-nutrients and C:N ratio, and evaluated for food production in on-farm trials. Results ۱۶S rDNA analysis screened sixteen bacterial isolates—eight related to genus Bacillus, three to each Halobacillus and Staphylococcus, one to each Microbacterium and Streptomyces. The population of bacteria was ۴.۵ cfu ml<sup>-1</sup> at ۱۰<sup>-7</sup> dilution. Aerobic- and vermi-composts matured in around ۵۰ and ۶۰ days, respectively. Aerobic-composting throughout recorded relatively higher bacterial population, and higher temperatures during the initial phase. Aerobic-compost tested for high nutrient (۱.۵۵% N, ۰.۹۳% P, ۱.۰۰% K) content and stable C:N ratio (۱۰.۳) compared to vermi-compost (۱.۱۱% N, ۰.۴۳% P, ۰.۹۶% K and C:N ratio of ۱۱.۷). Field evaluation of both composts showed yield benefit and saving of chemical fertilizers up to ۲۵%. Conclusions Aerobic-composting (using microbial consortium culture), like vermi-composting, proved to be an effective technology with advantage of no requirement to maintain ambient living conditions in lean periods as is required for earthworms in vermi-composting, but needs more energy/labor for biomass turnings.

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