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(57) Abstract :
ABSTRACT Trigoniulus corallines, a Diplopod as a Biosphere engineer: Cycling nutrients and manuring soil The present invention relates to an eco-biological method for nutrient cycling and soil enrichment using Trigoniulus corallines, a species of millipede belonging to the class Diplopoda. This invention harnesses the natural detritivorous behavior of T. corallines to decompose organic waste materials such as leaf litter, kitchen waste, animal dung, and agricultural residues. Under controlled environmental conditions, the millipedes are housed in moist soil trays enriched with organic matter. Through continuous feeding, the organisms digest the organic waste and excrete nutrient-rich fecal pellets. Laboratory analysis of the fecal matter reveals high concentrations of essential plant nutrients, including nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), and organic carbon. These nutrients significantly enhance soil fertility, structure, and biological activity. Unlike conventional composting or vermiculture, the T. corallinesbased system requires minimal maintenance, operates under ambient temperatures, and is highly adaptable to various environmental conditions. The invention provides a scalable, low-cost, and sustainable alternative to chemical fertilizers and traditional composting systems. It can be implemented in home gardens, community compost units, institutional waste systems, and agricultural farms. Furthermore, the fecal matter produced can be directly applied to soil or processed into commercial organic fertilizer products. By integrating a naturally occurring arthropod into waste management and agricultural practices, the invention contributes to sustainable farming, environmental conservation, and circular bio-economy principles. It represents a novel approach to ecological engineering, where Trigoniulus corallines functions as a biosphere engineer for nutrient recycling and organic soil conditioning.

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