



Earthworms and sewage sludge: circular economy in integrated water management

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Vermicomposting promotes circular economy through the development of an integrated cycle that allows *in situ* conversion of the sewage sludge generated in WWTPs into safe and valuable soil amendments.

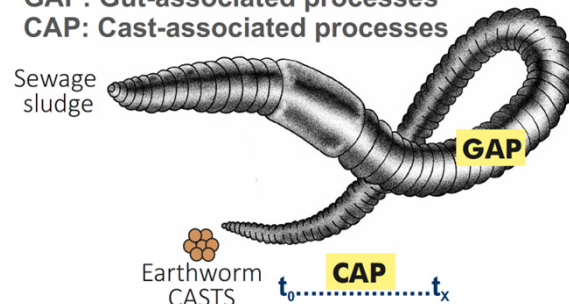
The amount of **sewage sludge** generated in wastewater treatment plants (**WWTPs**) keeps steadily increasing and **hundreds of million tons** are produced *every year all over the world*.

Their disposal causes **serious environmental problems**, particularly in terms of soil pollution by **microbial human pathogens (MHPs)**, **antibiotic resistant Genes (ARGs)**, **microplastics**, **heavy metals**, and **organic pollutants**.

Vermicomposting is an enhanced biooxidation process in which **epigeic earthworms** interacting with **microorganisms** accelerate the decomposition and stabilization of organic matter and substantially modify the physical, chemical, and biological properties of the organic wastes.

VERMICOMPOSTING

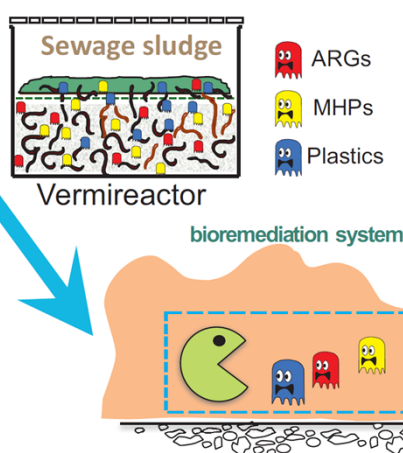
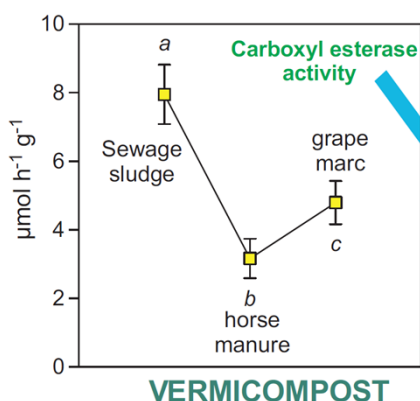
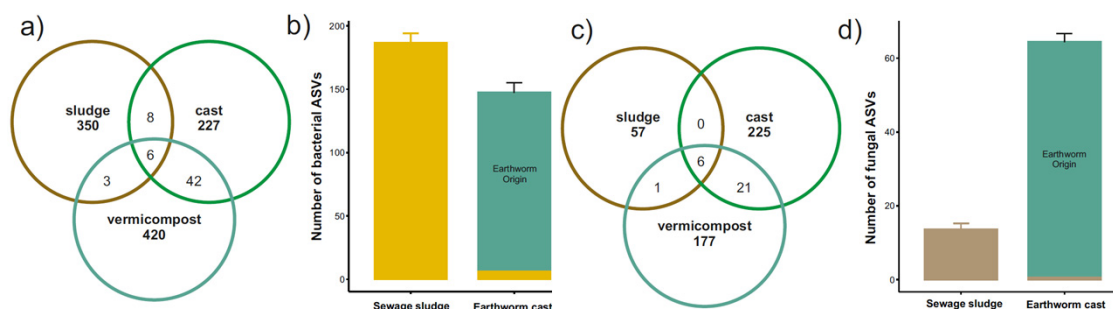
GAP: Gut-associated processes
CAP: Cast-associated processes



Vermicomposting facilities at the University of Vigo including the "industrial-sized" continuous vermicomposting flow reactor prototype with a capacity of 6 m³ designed and build by our group

—Most of the **bacterial (96%)** and **fungal (91%) taxa** were **eliminated** during vermicomposting

—**Microbial communities** in the **vermicompost** are **completely different** and **more diverse** than in **sewage sludge**



Vermicomposting is a promising **bioremediation system** for **eliminating pollutants** from sewage sludge

