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How litter feeding arthropods can promote carbon sequestration

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Soil fauna can support soil organic matter storage. Important mechanisms facilitation this effect is connected with bioturbation and mixing of organic matter with clay particles which can stimulate accumulation of microbial necromass on mineral surfaces as shown in earthworms. However it has been show that also litter feeding fauna which do not ingest mineral soil may slow down organic matter decomposition and support carbon storage. In this contribution we bring overview of potential mechanisms that may be responsible for this phenomena. Decreased decomposition rate in fauna excrements might result from the removal of easily available polysaccharides, the increase in aliphatic components, an increase in the resistant components of lignin, the accumulation of microbial cell walls (microbial necromass) by increasing of microbial turnover, by binding of nitrogen into complexes with aromatic components, which reduce N availability an finally by higher availability of nitrogen in leachate coming from fauna excrements which may cause negative priming effect and slow down decomposition. These mechanisms will be illustrated on examples and their implication of carbon sequestration will be discussed.