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The role of the harvester ants, *Messor ebeninus* and *M. arenarius*, in rehabilitation and sustainable cultivation of degraded arid lands, the Northern Negev: A case study

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Statement of the Problem: Many studies were conducted on the ants' life cycles; food supply etc., still their functioning in cultivated arid areas and as result, their rehabilitation efficiency for these areas is poorly analyzed.

Aim: Defining the harvester ants' impacts on different cultivated arid areas and their potential use for rehabilitation and sustainable management.

Methodology & Theoretical Orientation: A long term study carried out between 2008 and 2017 in the northern Negev (A heavily degraded and desertified area due to maximum levels of mismanagement, by repeated tilling and grazing without fertilizer inputs, fertility or grazing management) in different cultivated areas some conserved and other open lands on the harvester ants *Messor ebeninus* and *M. arenarius* functioning.

Findings: Our findings indicate that in tilled areas at the first years after conservation, the harvester ants raised yearly the soil organic matter in by 0.5%, due to their foraging, than by 0.5-1% per year by their nests functioning (which serve as sink for spreading nutrients in the area underground zone). At final state in well managed rainfed *Triticum aestivum* field we found an increase of 15% of the yields (grains and vegetative biomass for grazing) in 30% ants' nests cover. In rangelands we got a yearly continuant increase of 0.5-1% of SOM and for other fertility parameters as nutrients and vegetative biomass an increase of 30% per year caused by their nest-sink functioning and their soil loosening. In cultivated soil terraces the ants encouraged the herbaceous vegetal growth by their soil loosening, accumulated organic matter and enriched clay content.

Conclusion & Significance: Using adequate soil practices which do not interfere with ants' activity will accelerate rehabilitation, sustainable and profitable cultivation use for many degraded arid lands all over the globe.

Biography

Amir Mor-Mussery has his expertise on implementation of sustainable cultivation practices for arid loamy soils. His fields of interests include defying rehabilitation (or depredation) states of different cultivation practices, planning and monitoring grazing plans for arid rangelands, designing and managing agriculture terraces for halting runoff and rehabilitation of cultivated areas, savannas planning for increasing rangelands' productivity. He wrote many papers in peer reviewed journals on these issues and guide students and high school students on these issues.

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