



Soil tillage, physical disturbance and fauna population: a case study in western Iran

Jabbar Moradi

Czech Republic (rojyar.moradi@gmail.com)

As a vital biological habitat for a great number of organisms and a medium for soil food web, soil has a great importance in regulating the two main life-supporting processes: production and decomposition. For more sustainable agricultural systems, understanding the mechanisms shaping soil fauna populations is of great importance specially in semi-arid regions with low organic matter soils. In this regard a two year study in 2008 and 2009 was conducted in western Iran to see the consequences of implementing three different tillage systems (conventional, minimum and no tillage) and three levels of organic matter amendment (0, 20 and 40 ton.ha⁻¹ of cattle manure) over the population of soil fauna (i.e. earthworms, mite, springtail and nematodes) in three different sampling periods each year. In the second year BD decreased in the tillage treatments with mechanical turmoil but seems it started to increase in conventional tillage that can be due to higher decomposition of organic matter as the result of aeration and mixing of organic matter with the soil but shows a decrease pattern for the other two which can be due to less and no disturbance and as a result less elimination of soil aggregates. Observed earthworm populations were low besides of their patchy distribution that made the numbers unreliable to be interpreted. Soil mites showed no change regarding to treatments implemented which highlighted the importance of the need to observations in the suborder level and some other environmental variables. Soil springtails were reduced by soil tillage indicating their sensitivity to the disturbance in their physical habitat. Nematodes were mainly affected by organic matter. They showed an increase in their population (113 N.100g soil⁻¹) in 2008 with application of 40 ton.ha⁻¹ of cattle manure but in the second year because of the remaining effects of cattle manure the changes has been observed in response to the disturbance induced by tillage with the lowest numbers in conventional tillage (214 N.100g soil⁻¹). As well no significant difference between minimum tillage and conventional tillage has been observed in the corn biomass production. This suggest that no tillage and increased OM input cansubstantially increased densities of soil fauna in arable system.