Sorption, degradation and leaching of pesticides in soils amended with organic matter: a review

ABSTRACT

The use of pesticides in modern agriculture is unavoidable because they are required to control weeds. Pesticides are poisonous; hence, they are dangerous if misused. Understanding the fate of pesticides will be useful to use them safely. Therefore, contaminations of water and soil resources could be avoided. The fates of pesticides in soils are influenced by their sorption, decomposition and movement. Degradation and leaching of pesticides are control by sorption. Soil organic matter and clay content are main soil constituents that have a high capacity for sorption of pesticides. Addition of organic maters to amend the soils is a usual practice that every year has been done in a huge area of worldwide. The added organic amendments to the soils affect the fate of pesticides in soils as well. Pesticides fates in different soils are different. The addition of organic matter to soils causes different fates for pesticides as well. It is known from the studies that sorption of non-ionic pesticides by soil in aqueous system is controlled mainly by the organic matter content of the soils. Sorption of pesticides has been reported to increase by amending soils with organic matter. In general, conditions that promote microbial activity enhance the rate of pesticides degradation, and those that inhibit the growth of microorganisms reduce the rate of degradation. Amendment of soils with organic matter may modify leaching of pesticides in soil. Some studies showed that organic matter added to soils reduced pesticides in ground water. Generally, organic amendments induces the restriction of pesticides leaching in soils.

Keyword: Pesticides; Organic matter; Leaching; Sorption; Degradation