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Interactive comment on "Simulating microbial degradation of organic matter in a simple porous system using the 3-D diffusion based model MOSAIC" *by* O. Monga et al.

O. Monga et al.

olivier.monga@ird.fr

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a. Abstract, page 15615, line 11 "without any parameters change" may be changed to "without changing any parameters".

We have changed in the abstract "without any parameters change" by "without changing any parameters"

b. Introduction, page 15615, lines 18-22 authors can rephrase this sentence into two sentences to make it easier to read "Indeed, soil microorganisms live in a complex network of pores, resulting from the three dimensional arrangement of soil solid particles, which is more or less filled with air and water, variously interconnected and in which mi-

croorganisms as well as organic resources are heterogeneously distributed spatially" âĂŤ> "Indeed, soil microorganisms live in a complex network of pores, resulting from the three dimensional arrangement of soil solid particles. This network is more or less filled with air and water, variously interconnected and in which microorganisms as well as organic resources are heterogeneously distributed spatially".

We have rephrased the sentence as indicated above.

c. Introduction, page 15615, lines 21-22 change " heterogeneously distributed spatially" to "spatially heterogeneous"

We have changed as suggested above "heterogeneously distributed spatially" by "spatially heterogeneous".

d. Results and discussion, 3.1 Simulation of sand structure and water content, page 15625, line 10 change "used as the initial data of define the pore space" to " used as the initial data to define the pore space"

We have changed "used as the initial data of define the pore space" by "used as the initial data to define the pore space"

e. Results and discussion, 3.2 Simulation of fructose mineralization in sand, page 15625, line 13 change "mineralization at the high water content compare lower water" to "mineralization at the high water content comparing to lower water"

We have changed in line 13 "mineralization at the high water content comparing to lower water" by "mineralization at the high water content compared the one at the lower water content".

f. Note to authors It may be very useful to compare the results coming from modified (extended) MOSAIC II model with modified organic matter decomposition module to unmodified MOSAIC II model to see if the results are different and what is the importance of this change made in model.

To simulate the contact between OM and microbial biomass, MOSAIC I uses an empirical geodesic distance between microorganisms and organic substrate instead of a diffusion coefficient in water as used in MOSAIC II. This geodesic distance leads to an immediate availability of the substrate for microorganisms if connecting paths exist. The experiments described in the present paper used soluble organic matter (fructose) that can reach microorganisms by diffusing in the connected water filled pores. In mosaic I, the mineralization is not limiting by the diffusion although we assumed that in our experiment we have this limitation. Consequently, MOSAIC II is more appropriated to simulate the soluble organic matter degradation because it simulated diffusion process. We have added a sentence in the material and methods “The geodesic distance led to an immediate availability of the substrate for microorganisms if connecting paths exist “.

Interactive comment on Biogeosciences Discuss., 10, 15613, 2013.