Report on the collective training on Soil fractionation

Title : Soil Organic Matter fractionation

Date : 8th to the 10th of April 2014

Participants: 15
12 from LDD (6 from soil physics lab, 6 from soil chemistry lab), 2 from KU

Trainers:

- Tiphaine Chevallier: Soil scientist, IRD, UMR ECO&SOLS, France
- Nopmanee Suvannang: Co-director of LMI LDD, Director of Soil Analyses Technical Service


Localization: Laboratory LMI- Biotechnology Land Development Department

Funded by: LMI LUSES, Biotechnology Land Development Department

Context of this training

Soil organic matter nature and the soil spatial heterogeneity due to intimate interactions between the soil physical matrix, soil organic matter, and soil biota need to be characterize to understand soil organic matter dynamics or microbial habitats.

Methodology: Soil Organic matter fractionation
2 methods were presented: (i) soil fractionation with maximal dispersion to characterize soil organic matter stock (organic matter particle size fractionation) and (ii) soil fractionation into aggregate size.

The principle is to separate a soil sample into different soil particle-size fractions with no SOM destruction. Soil organic carbon and nitrogen content is measured on each particle-size fraction. Other analyses (microbial communities…) could also be done, especially when soil is separated in aggregate size class.
Soil is dispersed in water and sieved at 200, 50 and 20 µm. Coarse fractions were separated in organic and mineral fractions. The soil 0-20 µm is separated in 0-2 µm and 2-20 µm by sedimentation.

Short description of the training

The training will last 3 days, the first day will be devoted to the theoretical aspect of techniques for assessing the soil organic matter stock, the two others days will be

devoted to measurements and analyses of the data produced.

Soil Fractionation training		
Tuesday 8th April	**9h00 12h**	**Theoretical part** Presentation of the objective of the training : Alain Brauman (theory 15 minutes) Presentation on soil organic matter (in English by Tiphaine Chevallier, in Thaï by Nopmanee Suvannang) - Different pools of soil organic matter - Different way to characterize these pools - Different research questions -> different fractionations (in particle size class or in aggregate size class) Presentation of fractionation technic (in English by Tiphaine Chevallier, in Thaï by Nopmanee Suvannang) - Maximal dispersion technic - Separation in soil aggregates technic
	13h30 -14h30	**Preparation of soil samples dispersion (Practical 1h)** Soil + water + HMP + marbles + shaking
	15h00-16h00	**Preparation of material for the day after** Tare (Weigh) vessels
Wednesday 9th April	**8h00-12h00**	**Shaking of the soil preparation for 4 hours**
	13h30-16h00	**Sieving procedures** - 200 µm - 50 µm, 20 µm - Separation organic and mineral fractions by floatation
Thursday 10th April	8h00	**Fraction smaller than 20 µm** - 2 methods, isolate the 2-20 µm or not, start of sedimentation (Stocke's law)
	9h00-11h00	**Data analysis (Practical and theory)** - Excel file to fill with data and calculation, Examples - in English by Tiphaine Chevallier, in Thaï by Nopmanee Suvannang)
	11h00	**Discussion about the method of soil aggregates separation** in English by Tiphaine Chevallier, in Thaï by Nopmanee Suvannang)