Poster No. 1316

Analysis of Soil FAUNA for the Biomonitoring of Soil Quality

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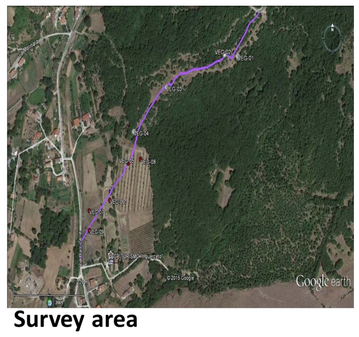
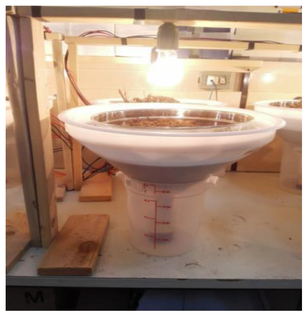
Soils Across Latitudes
Soil Science Society of America
International Soils Meeting
JAN. 6-9, 2019 | SAN DIEGO, CA

Soil fauna vitality has been proposed as an indicator for biomonitoring the status of soil stressed by mechanical insults. The "**Biological Quality of Soil**" (QBS Index) based on the biological forms of edaphic micro-arthropods (Acari Oribatei, Diptera, Pauropoda, Collembola, Isopoda, Annelida, Coleoptera, and Hymenoptera) is a measure of how well the soil fauna adapt to soil conditions and evolution. We used the QBS index to assess the evolution of soil during the five-year period 2013-2017 after oil pipeline implantation. The changes in the populations of micro-arthropod groups in forest and agricultural soils were analyzed, and a different score (1-20), defined EcoMorphological Index (EMI), was given to each biological form. The QBS is the sum of EMI scores. A Quality Class based on the QBS value was assigned to each sampling site.



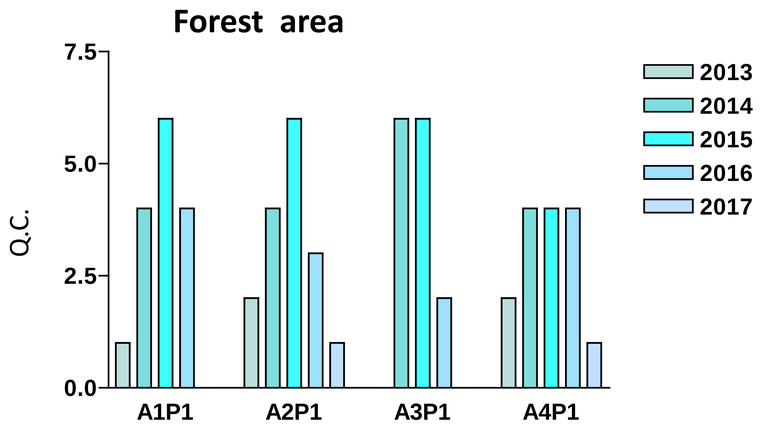
Survey area

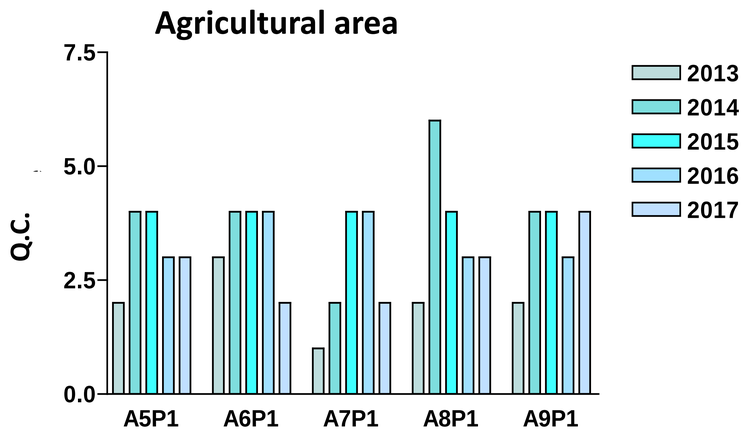


Forest Area	QBS	Q.C.
A1P1	16	0
A2P1	21	1
A3P1	2	0
A4P1	17	1

Agricultural Area	QBS	Q.C.
A5P1	67	3
A6P1	31	2
A7P1	31	2
A8P1	56	3
A9P1	77	4

QBS-Index and related Soil Quality Class (Q.C.)





Performance of the quality class(Q.C.) for each site belonging to the forest (1) and agricultural area (2) in the five-year period 2013-2017

A1-P1: Imenoptera, Larvae of Holometabola, Other adults of Holometabola
A2-P1: Collembola, Adults of other Holometabola
A3-P1: Emiptera, Adults of other Holometabola
A4-P1: Collembola, Hemiptera, Hymenoptera, Adults of other Holometabola
A5-P1: Tisanoptera, Coleoptera, Hymenoptera, Mites, Adults of Holometabola, Diplopoda.
A6-P1: Hymenoptera, Hemiptera, Adults of Holometabola, Mites.
A7-P1: Adults of other Holometabols , Mites, Larvae of Diptera,
A8-P1: Mites , Sinfiles , Collembola, Hymenoptera, Adults of other Holometabola
A9-P1: Collembola, Hymenoptera, Larvae of other Holometabes , Mites , Hemiptera, Adults of Holometabola, Isopodes, Sinfiles.

Results and Conclusion

The results obtained show an increase in the edaphic fauna concerning the forest area in the period 2013-2015, and a decrease in the years 2016 and 2017, which is an alteration from the biometric point of view, probably linked to the climate change occurred in the last two years. In the agricultural area a disturbance related to the anthropic activity was also observed in the last two years. The edaphic equilibrium is, therefore, very delicate and undergoes even deep modifications with the agricultural activities and with the seasonal climate variations.