Soil impact on vegetation

Beetles

GLOBE camp in Varemurru

10th of August 2021
Abstract

We made 3 excavations and collected samples from each of them.

We analyzed the samples and made the conclusion that soil does affect vegetation. Over a long time vegetation affects soil.

Figure 1. Us digging the first hole
Research questions and hypothesis

Soil is an important natural resource.

The disappearance of soil is a big problem in the world.

Is it possible to predict from places with different vegetation that soils will be different?

Places with different vegetation have different soil.
Research questions and hypothesis

Does flora affect the soil?

   Flora affects the amount of humus in the soil.

Does the soil affect vegetation?

   The thickness of the humus layer affects the amount of plants.
Research methods

3 soil excavations
measuring and describing soil horizons
soil temperature at 5 and 10 cm, plus air
temperature, humidity and atmospheric
pressure
soil humidity, structure

Figure 2. Us measuring the structure of the soil
Research methods

soil warp
the amount of roots
free carbonates
MUC code

photos of surroundings
color
consistency
soil horizons pH
the amount of stones soil warp

Figure 3. Soil warp in action
Tools

shovel, soil drill, scoops

cups
destilled water

measuring pole, measuring tape

horizon markers

marker

GLOBE pedosphere datasheets

Figure 4. Globisens lab-disc
Tools

pH-paper, pH-meter
Soil Color Book
MUC-code book
Vernier and Globisens lab-disc
soil thermometer
30% vinegar

Figure 5. Vernier’s sensor
Research area description

Figure 6. Location excavations
Location and weather description

Pärnumaa, Lääneranna vald, Matsi küla

The excavations were made 60-100m south-west from Varemurru recreation center’s yard.

Flat; 1.5 meters above sea level

11:00 10.08.2021

Temperature 22 degrees, humidity 63%, atmospheric pressure 1018 hPa

The day before was rainy.
Example of a worksheet

Figure 7. Worksheet of the C excavation
View around excavation site A

Figure 8, 9 and 10. Photos from excavation A to north, east and south
View around excavation site A

Figures 11, 12 and 13.
Excavation A - Go - leached glial soil

Table 1. Data of the excavation A

<table>
<thead>
<tr>
<th>horizon no</th>
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<th>2</th>
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<td>75+</td>
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<td>wet</td>
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<td>plastic clay</td>
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<td>5B 4/1</td>
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<td>sand clay</td>
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<tr>
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Excavation A

Three differentiable horizons (crude humus (AT), sand, clay)
The humus and sand layers were humid and the clay layer was wet
The two lower horizons of the soil profile were rich in rocks and free carbonates

Lush vegetation grows on a thick layer of humus (Betula, Populus tremula, Fraxinus excelsior, Acer platanoides, Alder, Urtica, Filipendula ulmaria, Aegopodium podagraria)

Due to the stoniness, it was not possible to dig deeper than 75 cm with a shovel and a soil drill was used to analyze the deeper profile (continued clay horizon)
View around excavation site B

Figure 16, 17 and 18. ...
View around excavation site B

Figure 19, 20 and 21. ...
# Excavation B - Kog - geysed leached soil

## Table 2. Data of the excavation B

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Excavation B

Five differentiable horizons (decay, humus, 3 different layers of sand, in the last peat stripes)

All layers except the second layer, which was dry, had wet horizons. In the metric well there was one sandstone in the third layer, which contained carbonates (there were no carbonates in the layers)

There was no shrub front and there were fewer plants than in well A (*Picea abies, Betula, Sorbus, Acer platanoides, Populus tremula, Convallaria majalis, Poaceae*)
View around excavation site C

MUC 1121
View around excavation site C

W

upward

downward
Excavation C - geyosed leached soil

Table 3. Data of the excavation C

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Excavation C

Seven distinguishable horizons (decay, humus, 4 distinct layers of sand, moraine)

The top layers were moist and the last two wet

In the fourth layer, at 40 cm, there was a thin darker stripe
The last layer was rocky (moraine)
The vegetation was dominated by conifers (*Pinus, Juniperus communis*),
the underlying vegetation is similar to well B (*Convallaria majalis, Fragaria vesca, Poaceae*)
Soils according to the soil map of Maa-amet

Excavations A and B corresponded to the soil types indicated on the soil map of the Maa-amet.

However, excavation C was more similar to the profile of excavation B, the bottom of the excavation was close to excavation A.
Comparison of excavations

Excavation A

Excavation B

Excavation C
Conclusion

Excavation A had a raw humus layer on top, excavations B and C had a thin layer of duff on top and a humus horizon below it.
Discussion

Is it possible to predict from places with different vegetation that soils will be different?

- Places with different vegetation have different soil. In our 3 excavations the plants growing on soil showed how the soils were different and how they were affected by the flora growing on ground.
Discussion

Does flora affect the soil?

- Flora affects the amount of humus in the soil. The decay contained leaves and other parts from trees and plants. The organic layer was thicker in deciduous forest.

Does the soil affect vegetation?

- The thickness of the humus layer affects the amount of plants. The type of soil defines what kind of vegetation has the ability to grow.
What could be better

New GLOBE soil colour books (old codes do not work with GLOBE data entry)

Different pH levels with different equipment (universal indicator)

Temperature measurement on different times

Sieves. the wet material was difficult to sieve, most of the particles remained on the 2.0 mm sieve