

Day report of Erasmus Intensive Program course: "Soil and Water" September 16th - 29th 2012.

Prepared by Dmitrii Krasnov and Valentina Zolotarjova (PhD students from Estonia).
Line in the text means a stop along the way for learning, questions and explanations.

26.09.12 (11th day)

7:30 - departure from Mercury Centre. We are going to visit Low Austria today!

10:05 – arrival to Hengstberg – agricultural landscape, dominates wine production.

- Here we met our guide – Dr. Leitgeb, who works in BFW (engl. Governmental Science Centre of Forest).
- This place is interesting because of loess landscape, which is used for grapes growing. Loess is a sediment formed by the accumulation of wind-blown particles. But because of loess, the erosion problem of soil is very wide spread.
- There is also considerably little forest (not managed any more) inside loess area, which is really important, because it provides ecological services: helps against erosion and provides habitat for forest species (higher biodiversity). Forest texture consists of sand and gravel; as a result, the soil is dry. Shrub – *Legustrum vulgare*.
- Here, we also met tree species: *Aesculus hippocastanum*, birch, Scots Pine (*Pinus sylvestris*), *Clematis vitalba*, *Robinia pseudoacacia*. Precipitation is low here, below 500 mm.
- Timber of (introduced) *Robinia* is used for piles which help grapes to grow, because the wood is resistant to decomposition. *Robinia* can fix N from the air, as a result is a successful pioneer species.

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- gravel – habitat of solitary bees (red species list)

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- hollows between loess – channels of water erosion
 - vine roots are very deep => can tolerate drought
 - ground water have stable isotope C¹³ => can distinguish proportion of how much water plants have from precipitation and how much from ground water
 - plants are growing better on the hill, because of cold air coming down from the hill and staying there

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- Bee-eater (*Meropidae*) nests in gravel – these birds are under protection

Important difference:

- Wasps – feeds their offspring with animal proteins
 - solitary bees – feeds their offspring with pollen
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- here we see an artificial basin to store water (prevents water from going down)
- gully erosion – loess is not very stable
- quality of wine could decrease if there would be droughts => plants in stress
=> it is reflected in flavor => wine is a good indicator of climate change

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- here we see strange machines, that looks like 1.5 m posts, which make noise to disturb grape-eating birds

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- white wine is typical for this area
 - here farmers usually don't use fertilization
 - copper in the soil from pesticide – not in the wine

12:16 in the bus

12:55 arrived to Dürnstein city – old houses, monastery and castle.

Break till 13:05

- here is Donau river, which is different now (compared to previous time): shape of the river is different (more straight), divided into many reservoirs above and below-stream to produce electricity. But at Dürrenstein still free stream present

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- going up to the hill, first through the city, then through a forest

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- we are on the hill called Dry Rock. Rock consist of silica minerals. There is almost no soil horizon here => nothing holds water
 - some birch trees (*Carpinus betulus*)
 - Beeches are a bit down (there the air was warmer). The higher up the mountain, the dryer it will be
 - Previously, there was wood extraction, but not anymore, because it is too difficult to pass
 - several enzymes are needed to completely decompose wood: legninas and cellulase. They are produced by fungi and bacteria. There are only one species known, which can digest cellulose without help of symbiotic bacteria - naval shipworm (*Teredo navalis*).

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- a lot of litter on the low-slope – natural re-distribution of nutrients.
 - here we can see *Taxus baccata* – have red poisoned fruits (slow birds distribution). It was used for bows in times past => therefore very seldom in forests today. Have male and female trees.
 - *Lamium sp* is growing here, because it prefers places with high N concentration

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- trees, which are situated down the valley are higher. Reasons: water flows away and huge amount of leaves are going down by wind
 - now we are 300 m above sea level

14:50 reached the top of the mountain. Name of the place: Kreuzung Volelbergsteig, 542 m, N 48°24.536 / 15°31.657

- At the upper level of the hill it is very dry => we can see *Vaccinium sp* shrubs, also *Deschampsia cespitosa*, *Pinus sylvestris*. Indicating low nutrient levels due to litter re-distribution down the slope
- *Fagus sylvatica* is dying because of water limitations.

- here is a castle Burgruine Dürnstein, 324m above the sea level, N 48°23.865 / 15°31.279

16:30 departure from Dürnstein

17:00 arrival to the dining place, which was organized by Dr. Leitgeb, who is a wine-grower as well. He was very kind and everyone got an opportunity to taste last and this year's wine. Also, he did a little excursion to the cellar, where wine is fermenting (preparing).

19:30 departure

21:45 arrival to Mercury Centre