The Baltic Sea Project

ESTIMATION OF AIR QUALITY USING BIOINDICATORS

Test: condition of fir trees, lichens, tar spot fungus – protocol to be sent to co-ordinator

Date: **20.05; 04.06 2013** School : **Kadrina Secondary School, Estonia**

Teacher : **Siret Pung** (siret.pung@gmail.com) Class/Group : **Form 11** (12 students)

Address : **Rakvere tee 4, 45201 Kadrina , Estonia**

Natural conditions and topographical situation (coastal, inland, mountain, plain): **inland; Kadrina**
Possible local source of pollution : **traffic; boilerhouse.**

I Fir trees

1, 2, 3. Investigating forest damage in fir trees

Name of the tree (fir, spruce or pine): **spruce**

Tree no.	1	2	3	4	5	6	7	8	9	10	Mean value
1. Needle loss class (1, 2, 3)	1	2	2	2	1	1	1	2	2	2	2
2. No. generations of needles	6	7	10	5	9	5	5	6	4	6	6,3
3. Occurrence of fear shoots (1, 2, 3)	1	1	2	2	1	1	1	1	2	1	1

II Lichen

1. Counting the number of kinds of different types of lichen

Name of the tree (English or Latin name): ***Acer platanoides***

Tree no.	No. kinds of crustose lichen	No. kinds of foliose lichen	No. kinds of fructicose lichen	Zone
1	3	3	2	4
2	2	2	2	4
3	2	-	2	4
4	2	4	1	3
5	1	3	2	4
			Mean value zone:	4

2. Determining the degree of coverage of the lichen

Name of the tree (English or Latin name): ***Acer platanoides***

Tree no.	Coverage of crustose lichen in %	Coverage of foliose lichen in %	Coverage of fructicose lichen in %	Total coverage of the whole overhead film in %
1	45	3	20	68
2	62	3	15	80
3	20	0	20	40
4	50	15	5	70
5	17	42	1	60
			Mean value :	57,2%
			Zone :	4

III. Tar Spot Fungus

Name of the maple tree (English or Latin name): ***Acer platanoides***

Zone: **3** *(autumn, 2012)*

IV. Discussion of the result and the state of the air on a separate paper.

The area of investigation – small borough of Kadrina – is located in Northern Estonia. It sits on the edge of uplands of Pandivere and is mainly surrounded by fields. The borough is situated near a quite busy motorway and is rather densely inhabited. In addition, there are some industrial buildings and a boilerhouse.

The air quality was measured in different places using common spruces and maples. The overall results were delightful. Needle loss of roadside spruces was a bit problematic, but that was probably caused by the car fumes. The average age of needles was 6.3 years, which was a rather good result. The occurrence of fear shoots was barely noticable.

Coverage and the number of lichen on the spruces was excellent. There were crustose, foliose and fructicose lichens of every investigated specimen and the average coverage surpassed 50% on our estimate. Therefore, we found that the air in Kadrina is very clean according to the lichen.

All in all, the results are pleasing. In spite of the dense inhabitation, the air is very clean. Only at the roadside one can notice some features of pollution, which is logical. However, the method is rather superficial and subjective, therefore we can't make any scientific conclusions based on these estimations.