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FACTORS THAT HAVE CONTRIBUTED TO THE DESTRUCTION OF THE ARBOREAL VEGETATION FROM THE MIHAI EMINESCU BOULEVARD AREAL – BOTOSANI MUNICIPALITY

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Key words: arboreal vegetation, vegetation destruction, pollution, rehabilitation works

Abstract. Botosani Municipality faces since 2008 to massive trees drying, in areas such as Mihai Eminescu Boulevard, Calea Nationala Street, Marchian Street. In many cases, although the trees have been toileted, treated with substances used for pest control, there couldn't be saved but very few specimens, but most of them have been cut down. Furthermore, on Mihai Eminescu Boulevard, there no longer leaf out for a few years the chestnut trees, sycamore trees, linden trees, cherry trees, acacia, maple trees, which probably will be cut down eventually.

Introduction

There have been spread many opinions concerning the destruction of arboreal vegetation on the above mentioned streets. For example, there has beed observed, by specialists of the Directorate for Agriculture Botosani, the wild chestnut moth (*Cameraria ohridella*) which can also migrate and destroy other tree species. There was also considered that abusive „groomings" have significantly contributed to the trees degradation process. There was also incriminated the de-snow activity, more specifically, the salt used in the non-skid solution spread in town in cold season, which, once it was stored, intentionally or accidentally, nearby or even at the root of the trees in the street straightways, it affects negatively the trees health, these ones giving signs of premature drying in the next spring. All these hypothesis spread can't be considered plausible arguments in establishing the real reason of destroying the arboreal vegetation on Mihai Eminescu Boulevard.

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The reason of this paper is to identify the natural or anthropic factors which led to loss of the arboreal vegetation on Mihai Eminescu Boulevard in Botosani Municipality.

Material and methods

For the data collection method there have been used both secondary informing sources and primary sources. The data presented are underlain by the information presented by the National Statistic Institute, Environmental Protection Agency, Town Hall, County Directorate for Agriculture Office for Plants Protection – Botosani. There have been also difficult collaborations, especially when this one implied the data or synthesis provision on activity fields. Observation in the field was used for inventorying and locating more exactly of the natural and anthropic factors which can influence the development of arboreal vegetation. Within the territory studied there have been executed a number of 4 soil profiles from which there have been picked up 12 soil samples in modified emplacement. At the soil samples picked there have been executed a number of analyses as it follows:

12	pH analyses in potentiometer extract
9	$CaCO_3$ analyses by Scheibler method
8	humus analyses, by Walkey-Black method in Gogoaşă/Puff ball modification
8	analyses N total, by Kyeldahl method
8	analyses P mobile, by Egner-Riehm-Domingo method
8	analyses K mobile, by Egner-Riehm-Domingo method
12	Granulometric analyses by Kacinski analysis
12	Soluble salts analyses

The analyses have been performed within the O.S.P.A. Botoşani laboratory. For a good characterization of soils, there have been determined, by calculation, the total amount of soluble soils. All these parameters are necessary to characterize the soils and determine the productive potential by solvability.

Results

The areal studied, from the urbanistic point of view, is situated within the incorporated area of Botosani municipality, in the central area. In figure 1 there is represented the street scanning field of Mihai Eminescu Boulevard in which we can observe that it looks like a green belt which crosses the central area and in its middle there is Mihai Eminescu park. The relief of the area is represented by a plateau situated at an altitude of about 156 m (Botosani Court) of which declivity is small, not exceeding 2% incline. From the climate point of view we may say that there are small differences in the area in relation to the general climate of Botosani

municipality. The plateau is laid-out parallel with 4 longitudinal traffic axix (Împărat Traian Street, Primăverii Street, Calea Naţională Street and Pacea Street) which produces an intensification of the air flow circulation. This intensification of the atmospheric dynamics produces a raise of the registered temperatures (daily, monthly, yearly), which usually are with $0,5^0$C higher than normal. Also, because of air-mass acceleration, the cloudy systems are easier diffused, so it is remarked a slight reduction of the rainfalls quantities, in relation to the normal. In the area there isn't lingered any lacustrine basin and it isn't crossed by the bed of a river or rivulet, excepting the recreation lake in Mihai Eminescu Park. Mihai Eminescu Boulevard distinguishes by the multitude of arboreal species planted parallel to the axis of movement. In 2008 there were the following species: linden trees – 418, sumac -19, paulonia - 68, fir tree - 56, cherry trees - 8, birch - 12, plum tree -3, sour cherry tree - 4, nut tree - 24, magnolia- 4, apple tree -4, mulberry -4, hornbeam -6, maple tree -6, oak tree -8, sallow -79, sycamore -4, elm -2, ash -3.

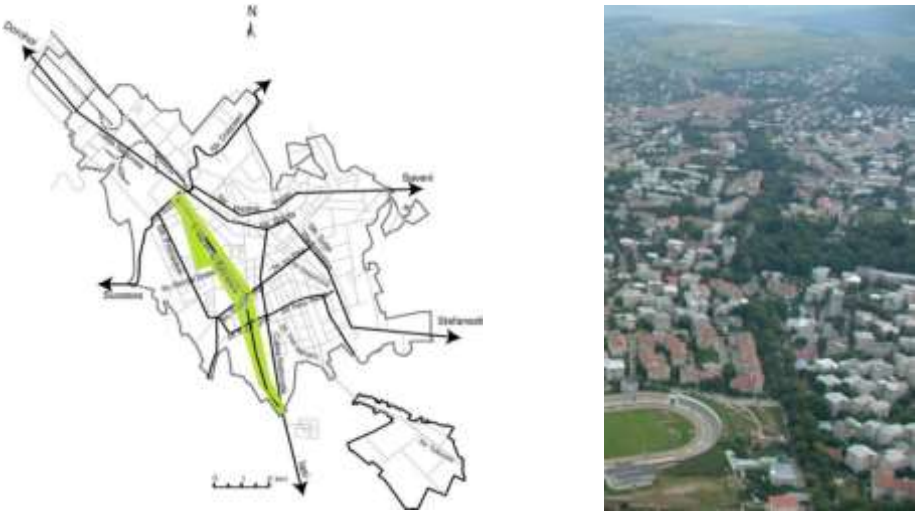

Fig. 1. The emplacement of „Mihai Eminescu boulevard" in Botoşani municipality

We may say that here is the largest vegetation surface reported per capita. In the below figure (figure 2) there is rendered the ponderosity of green spaces (green spaces and agricultural lands) on the territory of Botoşani municipality.

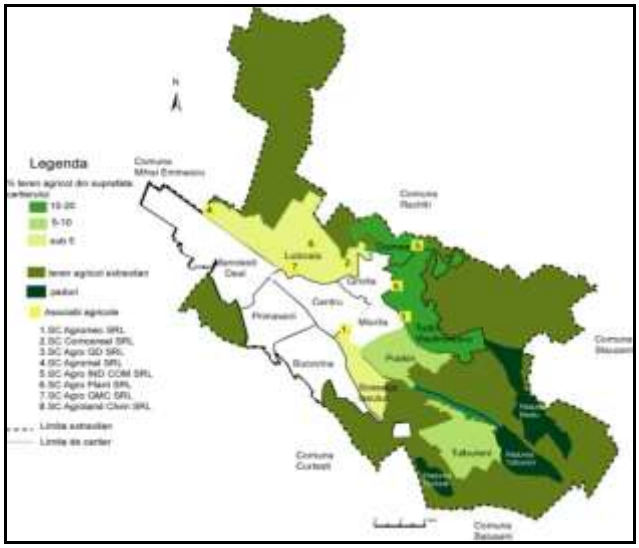

Fig.2. The ponderosity of green spaces on the territory of Botoșani municipality

According to the HCJ no 5/2008 in Botoşani municipality there has been instituted the local protection statute for the following species on Mihai Eminescu Boulevard (tab. 1):

Tab. 1. Species locally protected

Species	Localization	No. ex.	Age	Conservator
Oak (Quecus robur)	Intersection M. Eminescu Blvd. with Suceava NR (national road)	1	secular	BT Local Council
Oak (Quecus robur)	The boarding house of AT Laurian High School	1	secular	AT Laurian High School
Oak (Quecus robur)	Polyclinic Park	1	secular	Hospital Administration
Oak (Quecus robur)	M. Eminescu Park	1	secular	BT Local Council
Copper Beech (Fagus sylvatica var.atropurpurea)	Polyclinic Park	1	-	County Hospital Administration
Linden tree (Tilia cordata)	M. Eminescu Park	2	secular	BT Local Council

The area comprises approximately 35000 inhabitants in about 15000 families. The population has an age average of approximately 50 years. The majority of the population (approximately 95%) lives in dwellings – type- block with 4 floors. Analysing the map of the present localization of Botosani industry we observe that in the studied area there aren't industrial unities. The commerce activity is very well developed in this neighbourhood, here existing approximately 90

minimarkets, 8 pharmacies, 3 bookshops, 5 restaurants, 12 estival gardens. Analysing spacial repartition within incorporated area of all the education unities in Botosani municipality, there have been identified and delimited in Mihai Eminescu Boulevard the following education unities: schools 3, kindergartens 2, high schools 3. For the matter, here are concentrated the majority of administrative unities at the level of Botosani municipality and county as it can be observed in figure 4. After the analysis of bio-geographic and social-cultural profile of Mihai Eminescu Blvd areal we remark that the area with rich and diverse vegetation is not subject to industrial pollution. Even the auto traffic is reduced only to cars circulation with traffic heads around the hours 7.30 – 8.00 am, 12.30 – 1.00 pm, 4.00 – 5.00 pm. We may conclude that mass drying of arboreal vegetation pertain to Mihai Eminescu Blvd cannot be placed on the account of the anthropic activities developed daily. There have been researched other causes which could be the basis for destruction of arboreal vegetation, as it follows:

a. An article in the local press since 2011 caught up by the regional and national media affirms that *„Mihai Eminescu Boulevard was disfigured by the spring groomings. From the secular trees on the street edges, which according to the locals, gave charm to the place, have not left than trunks and a few branches. The specialists say that the trees of which head is cut more than 30 percent are doomed to dying. In the same situation are part of the trees on the edge of George Enescu boulevard".*

This thing was not confirmed by the workers within the Public Services, Sport and Recreation Directorate which belongs to Botosani municipality, they specifing that *„in case of groomings there are eliminated only the dried and broken branches from the canopy and they will be reduced with maximum 3 m of the length of branches pronounced inclined toward the roadway and near-by houses, in order to avoid producing prejudices to facades and to ensure traffic development in safety conditions. The works have also been executed in the period of vegetative rest in order not to affect their biological equilibrium".* However, the fact that the workers who perform the groomings are not controled at the ground, in the best case by a horticultural engineer, and they don't have the slightest idea why they cut a branch and not another one, this may represent a cause of losing and drying some trees. Usually they cut on all the branches *„to be sure"*. Furthermore, every plant has its own way to grow. For example – an ash that grows approximately 30 cm per annum cannot be cut such as a maple which is considered by the horticulturist a kind of *„cockle"* between trees and it grows quickly. Also *Yearly cutting-off some trees canopy (acacia, chestnuts, maples), keeping only the trunk and basal parts of inferior branches, is a reasonless practice, very hurtful, gradually depleting the canopy ability to regenerate and shortening the trees life"*[3].

b. The specialists within Botoșani Plants Protection Directorate set the speculation according to which the morbidity of vegetation in town could be caused by trees infestation with a fungus blight which is spread by careless cuttings. The management of the society Public Services, Sport and Recreation Directorate of Green Spaces doesn't admit this speculation *because „the workers are qualified and the instruments used are periodically cleaned and sterilized according to the normatives in force".*

c. The same specialists within Plants Protection Directorate, after some researches which held three years discovered, *the wild chestnut moth* (*Cameraria ohridella*) which can migrate and destroy other trees species, too. But, according to the same specialists the attack of this moth species cannot be the cause of a massive vegetation destroy.

d. Another variant was that the soil is polluted with substances that could affect the normal development of arboreal vegetation. Together with specialists of the Office for Pedological and Agro-chemical Studies in Botosani there have been sampled and analyzed 12 samples of soil (fig. 3) in the areal of Mihai Eminescu Blvd. The analysis bulletin of samples is rendered in table 2.

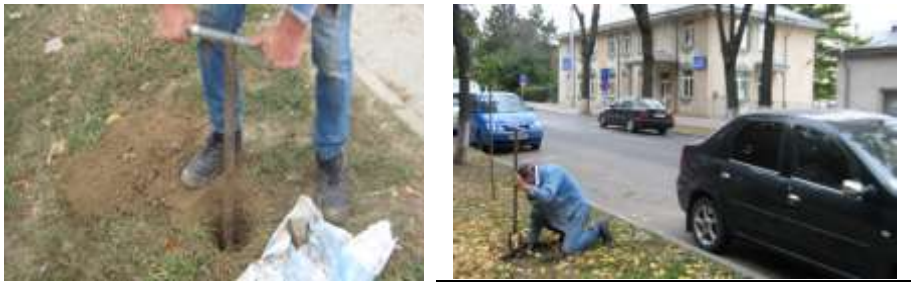

Fig.3. Sampling of soil samples Mihai Eminescu Boulevard

Tab. 2. Analysis bulletin of soil on Mihai Eminescu Boulevard

No.	Sample No.	pH (H2O)	Ah me at 100g soil	SB	VAh (%)	CaCO3 (%)	Humus (%)	IN	CTSS mg	P-AL Ppm	K-AL Ppm
0	1	2	3	4	5	6	7	8	9	10	11
1	1	8,47	0,19	0,56	75	2,20	2,42	1,82	137	34	224
2	2	7,81	0,25	0,45	64	1,86	1,96	1,25	187	74	198
3	3	7,88	-	-	-	3,22	-	-	152	-	-
4	4	8,54	0,12	0,99	89	4,82	2,19	1,95	115	96	472
5	5	8,04	0,19	0,41	68	-	2,19	1,49	147	90	528
6	6	7,85	-	-	-	-	-	-	153	-	-
7	7	7,81	0,19	0,76	80	2,96	2,31	1,85	71	115	294
8	8	7,99	0,25	0,40	62	1,61	1,62	1,00	50	59	318
9	9	8,11	-	-	-	1,35	-	-	50	-	-
10	10	7,96	0,25	0,61	71	1,95	3,00	2,13	71	53	336
11	11	8,00	0,25	0,61	71	2,03	2,65	1,88	52	90	306
12	12	7,58	-	-	-	-	-	-	45	-	-

In order to analyze the soil adaptation at arboreal plants culture there have been also realized 4 soil profiles. Hereinafter we will present the four soil profiles: The soil unit (field) no. 1, representative profile no. 1, end morphological description.

Horizon	Deepness	Morphological characteristics
Aop	0-18	Browny, modified structure, moist, moderate compact, it doesn't present effervescence with HCl, LL.
Ao	18-31	Browny, small granular structure, moist, moderate compact, it doesn't present effervescence with HCl, LL.
Bt	31-105	Browny -yellowish, small prismatic structure moist, compact, it doesn't present effervescence with HCl, TT.
BC	105-126	Yellowish- browny, big prismatic structure moist, moderate compact, it doesn't present effervescence with HCl, TT.
Cn	126-180	Yellowish, without structure, moist, moderate compact, it doesn't present effervescence with HCl, TT.

Soil unit (field) no. 2 , representative profile no., morphological description

Horizon	Deepness	Morphological characteristics
Aop	0-12	Browny, modified structure, moist, moderate compact, it presents low effervescence with HCl, LL.
Ao	12-22	Browny, small subangular polyhedral structure, moist, moderate compact, it doesn't present effervescence with HCl, LL.
Bt	22-90	Browny -yellowish, big prismatic structure, moist, compact, it doesn't present effervescence with HCl, LL.
C_n	90-150	Yellowish, without structure, moist, moderate compact, it doesn't present effervescence with HCl, TT

Soil unit (field) no. 3 , representative profile no.3,morphological description

Horizon	Deepness	Morphological characteristics
Aop	0-18	Browny, modified structure, moist, moderate compact, it presents low effervescence with HCl, LL.
Ao	18-20	Browny, small subangular polyhedral structure, moist, moderate compact, it doesn't present effervescence with HCl, LL.
AB	20-40	Browny -yellowish, small prismatic structure, moist, moderate compact, it doesn't present effervescence with HCl, LL.
Bt	40-118	Yellowish- browny, big prismatic structure, moist, compact, it doesn't present effervescence with HCl, TT
BC_k	118-135	Yellowish, partially without structure, moist, compact, carbonates in the form of small concretions, low effervescence with HCl, TT

Soil unit (field) no. 4, representative profile no. 4, Morphological description

Horizon	Deepness	Morphological characteristics
Aop	0-18	Browny, modified structure, moist, moderate compact, roots, it doesn't present effervescence with HCl, LL
Ao	18-35	Browny-grey, small angular polyhedral structure, moist, moderate compact, it doesn't present effervescence with HCl, LL.
Bt	35-80	Browny -yellowish, big prismatic structure, moist, moderate compact, it presents low effervescence with HCl, TT
BC	80-90	Yellowish- browny, without structure, moist, moderate compact, it doesn't present effervescence with HCl, TT
Cca	90-150	Yellowish-whitish, without structure, moist, moderate compact

Soil chemical characteristics

	US1/ Sample no.	1	2	3
	Horizon	Aop	Bt	Bt
	Deepness	10-20	50-60	80-90
	pH	8,47	7,81	7,88
	Carbonates %	2,20	1,86	-
	Humus	2,42	1,96	
	P mobile ppm	34	74	
	K mobile ppm	224	198	
	SB (me)	0,56	0,45	-
	C.T.S.S.	137	187	152
GRADING	Grit	0.25	0.25	0.14
GRADING	Fine sand	42.21	39.21	35.66
GRADING	Dust 1+2	31.16	32.96	26.70
GRADING	Colloidal clay	26.38	27.58	37.50
GRADING	Physical clay	41.52	44.96	51.32
	Texture	LL	LL	TT
	Text differentiation			1.35

	US2/ Sample no.	4	5	6
	Horizon	Ao	Bt	Bt
	Deepness	10-20	50-60	80-90
	pH	8,54	8,04	7,85
	Carbonates %	4,82	-	-
	Humus	2,19	2,19	-
	P mobile ppm	96	90	-
	K mobile ppm	472	528	-
	SB (me)	0,99	0,41	-
	C.T.S.S.	115	147	153
GRADING	Grit	0.67	0.83	0.12
GRADING	Fine sand	40.27	35.88	38.11
GRADING	Dust 1+2	30.46	28.91	23.63
GRADING	Colloidal clay	28.60	4.38	38.14
GRADING	Physical clay	46.13	52.02	50.68
	Texture	LL	TT	TT
	Text differentiation		1.20	

	US1/ Sample no.	1	2	3
	Horizon	Aop	Bt	Bt
	Deepness	10-20	50-60	80-90
	pH	8,47	7,81	7,88
	Carbonates %	2,20	1,86	-
	Humus	2,42	1,96	
	P mobile ppm	34	74	
	K mobile ppm	224	198	
	SB (me)	0,56	0,45	-
	C.T.S.S.	137	187	152
GRADING	Grit	0.25	0.25	0.14
GRADING	Fine sand	42.21	39.21	35.66
GRADING	Dust 1+2	31.16	32.96	26.70
GRADING	Colloidal clay	26.38	27.58	37.50
GRADING	Physical clay	41.52	44.96	51.32
	Texture	LL	LL	TT
	Text differentiation			1.35

	US2/ Sample no.	4	5	6
	Horizon	Ao	Bt	Bt
	Deepness	10-20	50-60	80-90
	pH	8,54	8,04	7,85
	Carbonates %	4,82	-	-
	Humus	2,19	2,19	-
	P mobile ppm	96	90	-
	K mobile ppm	472	528	-
	SB (me)	0,99	0,41	-
	C.T.S.S.	115	147	153
GRADING	Grit	0.67	0.83	0.12
GRADING	Fine sand	40.27	35.88	38.11
GRADING	Dust 1+2	30.46	28.91	23.63
GRADING	Colloidal clay	28.60	4.38	38.14
GRADING	Physical clay	46.13	52.02	50.68
	Texture	LL	TT	TT
	Text differentiation		1.20	

US3/ Sample no.		7	8	9
Horizon		Ao	Bt	Bt
Deepness		10-20	50-60	80-90
pH		7,81	7,99	8,11
Carbonates %		2,96	1,61	1,35
Humus		2,31	1,62	
P mobile ppm		115	59	
K mobile ppm		294	318	
SB (me)		0,76	0,40	-
C.T.S.S.		71	50	50
GRADING	Grit	1.72	2.31	4.53
	Fine sand	37.99	34.16	32.62
	Dust 1+2	28.93	27.35	24.30
	Colloidal clay	31.36	36.18	38.55
	Physical clay	48.49	52.97	53.23
Texture		LL	TT	TT
Text differentiation			1.15	

US4/ Sample no.		10	11	12
Horizon		Ao	Bt	BC
Deepness		10-20	50-60	80-90
pH		7,96	8,00	7,58
Carbonates %		1,95	2,03	-
Humus		3,00	2,65	
P mobile ppm		53	90	
K mobile ppm		336	306	
SB (me)		0,61	0,61	
C.T.S.S.		71	52	45
GRADING	Grit	0.40	0.33	0.09
	Fine sand	34.38	31.31	25.32
	Dust 1+2	32.63	27.37	28.83
	Colloidal clay	32.59	40.99	45.76
	Physical clay	34.38	54.16	62.48
Texture		LL	TT	TT
Text differentiation			1.25	

After soils diagnosis and classification there have been identified 4 soil units belonging to the following class – ***Luvosoil*** with type *typical preluvosoil*. Luvisoils Class (LUV) - This class of soils presents an A horizon (or A and E) and an argic horizon (Bt) which has colours with values and chromes of over 3,5 (to wet), beginning with the superior part of the horizon. They cannot present in the first 50 cm, intense stagnic properties (W) and gleic properties (Gr). Preluvosoil Type (EL)-

There are luvisoils morphologically characterized by: the presence of horizon A ocric or A molic (Ao, Am), followed by the intermediate argic horizon (Bt), and the saturation degree in alkalis (V%) is over 53%.The preluvosoil is the type of soil characteristic for this territory, met on versants and plateaus, being found near the luvosoils. The parental material is varied enough, come especially from sedimentary roks, composed of middle and middle-fine eluvial and adobe deposits – carbonatic lutes and without carbonates, carbonatic clays ans loess. All the materials on which there are formed the preluvosoils contain basic elements.

The PH is neutral on the surface and it raises to neutral in-depth, low alkaline and moderate alkaline (pH 7,58-8,47).The texture is differentiated on profile, the textures varying between medium lute and medium clayish lute on the surface and medium clayish lute- heavy clay in the basis. The humification is moderate, and the resulted humus quantity is moderate on the surface (US2 – 2,19; US4 – 3,00). The more humid climate and cold enough favours pronounced alteration of the mineral matter, resulting important clay quantities. The low leaching from this type of soil isfavoured by the relief, too (versants), with good external drainage, from which water overflows and it doesn't percolate enough the soil. The texture is fine middle or fine, the soil profile is textual differentiated (1,15 – 1,35), the maximum clay

content is registered at the level of Bt horizon. The structure is granular or polyhedral subangular in horizon A and prismatic in Bt.

The morphological construction of the profile is type: Ao –AB – Bt – Ck(ca). Horizon A of 20 – 35 cm, has a brown colour or brown grey, the texture is heavy and lute clayish, the structure middle and big granular, well formed, fine porous, medium and heavy compact, well biological activity, progressive passing, delimitating a passing horizon AB with intermediary properties. Horizon Bt , of 35 – 80 cm, of brown or brown yellowish colour, tarnished sometimes by the stagnogleying phenomenon, medium heavy texture, lute-clayish or clay-heavy, prismatic structure well formed, fine porous, compact, medium and heavy compact, evident pellicles of colloidal cley on the surface of the structural aggregates, progressive passing, regradated sometimes with carbonates from the horizon Ck or Cca. The horizon Cn, Ck or Cca, lighter in colour, with different texture according to the parental material, but predominant middle fine and fine, usually systemless.

According to the local pedogenetic conditions there were met the following sub-types: Typical preluvosoil lute – clay – powdery (US1),Typical preluvosoil, lute – clay medium (US2),Typical preluvosoil, lute – clay medium (US3),Typical preluvosoil, clayish – heavy (US4). These soils include the following soil units: US 1, US 2, US 3, US 4 which overlap on plateaus.

The soil formation rock is represented by clays (US4) and loess deposits (US1, US2, US3). The hydrostatic level is lingered at over 5 m. The horizon thickness on the surface oscillates between 20 cm (US3) and 35 cm (US4). The chalk content in the first 125 cm is between 1,35%(US3) and 4,82%(US2).

The humus quantity in the superior horizon is between 1,62 % (US3) and 3,00% (US4).The texture on the surface is medium lute (LL) and in-depth medium clayish lute (TT). The soil reaction oscillates from low alkaline (pH 7,58 – US4) to moderate alkaline (pH 8,47 - US1).Seen on the whole, the surfaces which are the object of the present paper, are grouped according to the pH in the category: low alkaline (pH 7.3-8.4). In case the soil is very alkaline or very acid the plants cannot absorb the necessary nutritive substances and there may appear nutritive deficiencies (plants yellowing or their involution). Concordantly with the pH and the indices which characterize the cationic exchange capacity (Ah, SB and V%) it doesn't present very large variations. From the point of view of supply condition with mobile phosphorus (P_{AL}), the terrains studied are grouped this way: medium (18.1 – 36),good (36.1 – 72) ,very good (>72).Analyzing the supply condition of soils with mobile potassium there is remarked the fact that all the samples analyzed are very well stored: K-AL >200. *IN* values smaller or equal with 2 show a low level of soil supply with azoth (US1, US2, US3), between 2,1 and 4,0 shows a middle supply (US4), between 4,1 and 6,0 means a good supply, and values bigger than 6,0 show a very good supply. As a conclusion we may say that the detailed

agro-chemical and pedological analysis of 12 soil samples sampled from the areal of Mihai Eminescu blvd. shows that the ***soil is not polluted and it is suitable for planting trees.***

d. There was also issued a supposition whereby the diggings performed by the contractors who won the auctions organized by Botosani municipality in order to modernize the town infrastructure, led to drying and death of arboreal vegetation. During the years 2006-2013 the infrastructure pertain to Mihai Eminescu boulevard (water supply, sewage, ornamental lighting, video surveillance, thermal energy etc.) was modernized by implementing more projects with external financing ISPA, SAMTID, POS Environment etc. The works within these projects needed realizing some diggings (some of them exceeded 4 meters in depth) which were indicated (by the designers) over the street straightway formed of course of arboreal vegetation (fig. 4). The majority of trees affected by diggings after a winter in which the roots remained discovered flourished and leafed out then they dried. This situation is due to very low temperatures during winter, which generated frost and destruction, in roots area and in the inferior part of the stalk (over the snow), of the free-wooden vessels (sap conducting), situated immediately under the bark. The trees started in vegetation due to reserve substances and water which got up by capillarity or wooden vessels situated more from the inside, but the sap elaborated by the leaves appeared couldn't go back to roots through phloem vessels wretched. The roots die and determine the drying of the whole tree already leafed out.

Fig.4. Works which affects the vegetation performed on Mihai Eminescu Boulevard

e. Concerning the air pollution in Botosani municipality and the impact on vegetation we must make evidence of the fact that there were identified some pollution sources. From the category of stationary (fixed) sources of air pollution, the greatest ponderosity represents the industrial unities with different degrees of implication by the economic agents: energetical industry, of cars and equipments construction, chemical industry, wood processing industry, construction materials industry, textile and confections industry, food industry, fuels distribution stations, asphaltic mixtures stations, dust hole. From the category of mobile sources of air

pollution in Botosani municipality, the greatest ponderosity represents the existent means of transportation which generate carbon dioxide, white damp, hydrocarbons partially unfired, nitrogen oxides and different sulphur compounds. The pollution degree in Botosani municipality varies in time in diurnal condition, weekly and yearly. In diurnal condition there are two maxima and two minima: the main maximum is around 8 o'clock a.m., (because of begining the activity and traffic in town when the thermal convection is still weak or it hasn't appeared yet), and the secondary one around 6-8 p.m., when the traffic is intensified again and the convection is weak or it has already stopped. The main minimum is registered during night and the secondary one at lunch. In weekly condition, the pollutants concentration increases on Monday, it reaches the maximum at the middle of the week and decreases on Friday until Sunday because of reducing the activities. In yearly condition, in winter, the ascendant convective movements of the air are diminished, artificial heating becomes an important pollution source registering maximum concentrations. From October until February the frequency of thermal inversions increases, the photosynthesis is reduced a lot, and cloudiness and fog emphasizes the pollution degree.

In the rezidential field there are issued great quantities of COVNM, CH_4 and CO_2, followed by smaller quantities of CO , NOx, SO_2 and powders. The emissions rose in the last years because of increasing the number of individual heating plants, and COVNM come from burnings of food preparation facilities, ovens and chimneys. Concerning the presence of powders in PM_{10} gel in the atmosphere of Botosani municipality between 2000-2009, there are important exceedings, the yearly maximum admitted concentration being exceeded in six of the 10 years analyzed. We talk about the years 2000, 2001, 2002, 2004, 2007 şi 2009. The highest middle monthly concentrations are in the cold months (especially November, December, January and February), when there are frequent exceedings of the limit values, and the most low concentrations in the warm months, the cause of this decrease being the reducing of fuels quantity used for heating. High values in the cold period coincide with the periods when there is used non-skid material, when emissions in traffic are higher and the energetical industry functions at the entire capability. In 2008 and 2009 the daily limit value was exceeded most frequent in January. The frequency of daily exceedings in 2008 was 24,7% and in 2009 was 23%. The emissions go to 200 $\mu g/m^3$ at night, because some societies prefer to work at maximum capacity during night, when monitoring is almost imposible to realize in conditions they don't have proper automatic equipments based on thermostat bulbs. There is the alternative that during night this to use a fuel of poor quality, resulting more smoke, ash, grime. Also, there where are devices for holding the powders and electric filters, not to be used at proper capacity, at night. The atmosphere laden with dust all the year can be

associated with the dynamic of activities developed in the municipality, the main sources being the construction of houses, modernization of the centre of municipality, implementation of programs for replacing the underground pipes and plants belonging to the local water and district heating supplier. For $PM_{2,5}$, in 2008, the daily average exceeded the limit value for health protection in 14,13% of cases, and in 2009, in 13,86% of cases. The main areas affected by the atmospheric pollution in Botosani municipality are the surfaces situated near the industrial area, the south-western extremity of the town (ANL Bucovina neighbourhood and in the vicinity if the mulitary unity) where there are frequently deposits of the particles transported by wind on the directions NW and W and the central area (Panda – County Library), because of the traffic and urban proper agglomeration. The maximum concentrations of the main atmospheric pollutants depend in a big way on the productive cicle of companies but also on the carelessness or incompetence of the human factor (accidental pollutions). The pollution is amplified by using some outdated technologies, the absence of filtering plants and technical problems of cars.

In conclusion, the climatic factors influence the processes of emission, transport, dispersion, stagnation and reactivity of atmospheric noxae in close dependency with the aggregation situation, the pollutants mass and reactivity. From the presented evolution there cannot be established symmetric, general situations related to the climate – pollution relation. We cannot generalize saying that there are repetitions of situations according to days, rush hours, week or season end. We cannot generalize because of the reduced probability to have the same meteo conditions in the same periods of time, and to establish an action manner, in case of a climatic element the emission, the initial immission and the climatic factors implied in the pollution and remediation processes of the atmosphere to be constant in a period in which we should follow the action only of one climatic element, which is almost impossible. So, we cannot talk about a real pollution of the air in Botosani municipality and much more we cannot talk about a concentrated pollution which has destructive effects over arboreal vegetation.

Conclusions

As a response at massive arboreal vegetation losses the town hall of Botosani municipality developed more planting actions on the old locations with two species of linden trees, totally 97 exemplars with a height of 3 meters, circumference of 12-14 cm and diameter of 5 cm. After 3 years from planting their condition is very good. A form of local pollution, no matter its nature is, would have been affected the new saplings. *It remains plausible the hypothesis according to which the old species being planted in the same period shall be finished the live biological cycle*.

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