

RESEARCH ON TWO PASTURES SITUATED IN THE NORTH AND EAST OF BUCHAREST

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Abstract

In two pastures situated in the North and East of Bucharest field studies were conducted and the results are presented to compare them by the specifically composition, life forms, chorological, and ecological categories.

INTRODUCTION

A current problem in modern urban areas is the need to mediate between the extension of the buildings area and maintaining or increasing the area occupied by green space. Among the solutions proposed include the implementation of green roofs. There are several systems that may be used, one is represented by the making up of an herbaceous carpet, with a little support, where the vegetation is installed and develops by itself. It is therefore necessary to know the characteristic flora of Bucharest and its possible developments. Our study adds to previous research on the flora of Bucharest and its surroundings, research which can be grouped as follows: a) research on composition by species - of the authors: Dimitrie Brandza, D. Grecescu, Zaharia C. Pantu, Lucretia Spiridon [6]; b) research on the anthrophile plant associations: I. Morariu [4, 7, 8, 9]; c) studies on adventive species of Bucharest flora: Paulina Anastasiu [1]; G. Negrean, N. Constantine [10].

MATERIAL AND METHODS

Research was conducted on two pastures, one located near Băneasa forest, to exemplify the situation in the Northern area, and the second near the lake Pantelimon I on a vacant lot used, sometimes as pasture to exemplify the situation in the Eastern area. There are made up lists of characteristic species to compare the vegetation of the two chosen locations. Observations were conducted in spring and summer time to capture the vernal and aestival aspects, as is recommended for pastures in the lowland area [6]. The working method consisted of crossing the land diagonally and writing down of all encountered species. They were listed in

the tables to determine the phytocoenosis composition in terms of: species, life forms, chorological and ecological categories.

RESULTS AND DISCUSSION

A. Vernal flora

1. The analysis of plant communities located in the North of Bucharest
Specifically composition: were recorded 39 species from 15 families. Species distribution on families were: *Asteraceae* - 10 species, *Fabaceae* - 5 species, *Brassicaceae* - 4 species, *Scrophulariaceae* - 4 species, *Poaceae* - 3 species, *Boraginaceae*, *Lamiaceae*, *Rosaceae* - 2 species, *Apiaceae*, *Caprifoliaceae*, *Caryophyllaceae*, *Convolvulaceae*, *Cornaceae*, *Plantaginaceae*, *Polygonaceae* - 1 species. Of the 39 species, depending on the appearance and duration of life has been recorded: annual - 9 species (23.07%); annual hibernating - 3 species (7.69%); biennial - 3 species (7.69%), annual-perennial - 3 species (7.67%), perennial - 19 species (48.71%), woody species - shrubs 2 species (5.12%). **Life forms:** *therophytes* - 16 species (41.02%); *hemichryptophytes* - 17 species (43.58%); *geophytes* - 3 species (7.69%); *chamaephytes* - 1 species (2.56%); *phanerophytes* - 2 species (5.12%). **Chorological elements:** most species are of Eurasian origin (25 species, 64.10%), followed by Cosmopolite (7 species, 17.94%), European (3 species, 7, 69%), Adventives (1 species, 2, 56%), Pontic - Caucasian (1 species, 2.56%).

2. The analysis of plant communities located in the East of Bucharest
Specifically composition: 39 species were recorded in 15 families. Distribution of species by families was as follows: *Poaceae* - 6 species, *Brassicaceae* - 5 species, *Asteraceae*, *Fabaceae* - 4 species, *Scrophulariaceae*, *Boraginaceae*, *Rosaceae* - 3 species, *Caryophyllaceae*, *Geraniaceae*, *Lamiaceae* - 2 species, *Apiaceae*, *Malvaceae*, *Rubiaceae*, *Plantaginaceae*, *Polygonaceae* - 1 species. Of the 39 species, depending on the appearance and duration of life have been recorded: annual - 14 species (35.89%); annual hibernating - 2 species (5.12%); biennial - 5 species (12.82%), annual-perennial - 2 species (5.12%), perennial - 16 species (41.02%), woody species - 1 shrub species (2.56%). **Life forms:** *therophytes* - 17 species (43.58%); *hemichryptophytes* - 19 species (48.71%); *geophytes* - 2 species (5.12%); *phanerophytes* - 1 species (2, 56%). **Chorological elements:** Eurasian origin (28 species, 71.79%), Cosmopolite (6 species, 15.38%), European (3 species, 7.69%), Adventives (1 species, 2.56%), Pontic - Caucasian (1 species, 2.56%).

Comparing the two surveys in terms of specific composition, it is found that in both cases the total number of species (39) and families (15) is equal. However, species distribution on families differs: in the North zone are predominant plants of *Asteraceae* family - 10 species, while in the East zone those of *Poaceae* family - 6 species.

A total of 12 species noted in the survey of land made in the North of Bucharest were not found in the East, namely: *Lathyrus tuberosus*, *Lotus corniculatus*, *Trifolium repens*, *Cornus sanguinea*, *A Armoracia rusticana*, *Thlaspi arvense*, *Artemisia absinthium*, *Arctium lappa*, *Carduus acanthoides*, *Cirsium arvense*, *Erigeron annuus*, *Matricaria perforata*. In the East there are a number of 15 different species from those in the North, namely: *Silene alba*, *Potentilla reptans*, *Vicia angustifolia*, *Vicia sativa*, *Erodium cicutarium*, *Malva sylvestris*, *Alyssum desertorum*, *Bertheroa incana*, *Anchusa ochroleuca*, *Echium vulgare*, *Verbascum phlomoides*, *Galium mollugo*, *Phragmites australis*, *Dactylis glomerata*, *Festuca valesiaca*.

In both areas predominantly are herbaceous perennial plants to annual ones, and that those from *Hemichryptophyta* form of life, which indicates a climate with thermal or humidity deficiency; the same thing is signalized by the abundance of *Poaceae* formations with perennial grass of the pasture type.

The predominance of the Eurasian species is according to the general rule to the cormophytes in our country where the species of this group are the best represented. The cosmopolitan species, ranked second like number in the two pastures, emphasize the ruderal characteristic of the two lands.

In terms of requirements for soil moisture, nearly half of the species identified in the North are plants with moderate requirements (xero-mesophilic), again emphasizing the character of steppe grasslands of the association. In the East this characteristic is more evident: here 22 of the 39 species are xero-mesophilic.

Most of the species are indifferent to air temperature and soil reaction.

B. Aestival flora

1. The analysis of plant communities located in the North of Bucharest

Specifically composition: were recorded 47 species of 19 families. Distribution of species by families was as follows: *Asteraceae* - 13 species, *Poaceae*, *Fabaceae* - 7 species, *Scrophulariaceae* - 3 species, *Brassicaceae*, *Rosaceae* - 2 species, *Apiaceae*, *Caprifoliaceae*, *Boraginaceae*, *Convolvulaceae*, *Cornaceae*, *Juglandaceae*, *Onagraceae*, *Malvaceae*, *Oxalidaceae*, *Papaveraceae*, *Plantaginaceae*, *Polygonaceae*, *Ulmaceae* - 1 species. Of the 47 species, depending on the appearance and duration of life, have been recorded: annual species - 10 species (21.27%); annual hibernating - 1 species (2.12%); biennial - 5 species (10.63%), perennial - 27 species (57.44%), woody species - shrubs 2 species (4.24%), tree 2 species (4.24%). **Life forms:** *therophytes* - 15 species (31.91%); *hemichryptophytes* - 21 species (44.68%); *geophytes* - 5 species (10.63%); *chamaephytes* - 2 species (4.24%); *phanerophytes* - 4 species (8.51%). **Chorological elements:** of Eurasian origin (23 species, 48.93%), Cosmopolite (9 species, 19.14%), European (7 species, 14.89%), Adventives (4 species, 8.51%), Pontic - Caucasian - (1 species, 2.12%), Mediterranean (1 species, 2.12%).

2. The analysis of plant communities located in the East of Bucharest
Specifically composition: were recorded 50 species in 19 families. Distribution of species by families was as follows: *Asteraceae* - 12 species, *Poaceae* - 9 species, *Fabaceae* - 6 species, *Brassicaceae*, *Rosaceae* - 3 species, *Boraginaceae*, *Caryophyllaceae* - 2 species, *Apiaceae*, *Caprifoliaceae*, *Convolvulaceae*, *Geraniaceae*, *Elaeagnaceae*, *Lamiaceae*, *Malvaceae*, *Papaveraceae*, *Plantaginaceae*, *Rubiaceae*, *Scrophulariaceae*, *Simarubaceae*, *Ulmaceae* - 1 species. From the 39 species, depending on the appearance and duration of life have been recorded: annual - 10 species (20%), annual hibernating - 2 species (4%); biennales - 10 species (20%), perennial - 21 species (42%), woody species - shrubs 1 species (2%), trees 3 species (6%). **Life forms:** *therophytes* - 14 species (28%); *hemychryptophytes* - 26 species (52%); *geophytes* - 6 species (12%); *phanerophytes* - 4 species (8%). **Chorological elements:** most species are of Eurasian origin (28 species, 56%), followed by Cosmopolite (11 species, 22%), European (6 species, 12%), Asian (2 species, 4%), Adventives (1 species, 2%), Ponto-Pannonian (1 species, 2%), Atlantic 1 - (2%).

In the aestival survey in the North of Bucharest were recorded 47 species from 19 families. Most species are, as for the survey of spring, of the *Asteraceae* family - 13, followed by those of *Poaceae* - 7.

In the East of Bucharest were also recorded 50 species of 19 families, most of them of *Asteraceae* family - 12, followed by those of *Poaceae* - 9. Compared to the vernal survey, in both cases the increasing of the number of species was observed. It was found that in summer survey were noted some common species, which in vernal survey don't appear, because, in the particular conditions of the land, they have become evident later from the date of the first observations. Also, there are some species which were completed their growing cycle and disappeared.

There are a number of species characteristic of each area that were not found in the survey conducted in the opposite location. In the case of land located in the North, they were: *Juglans regia* (occurred because of a nut tree alignment existed near the observation site), *Lathyrus tuberosus*, *Medicago sativa*, *Melilotus officinalis*, *Trifolium arvense*, *Trifolium pratense*, *Cornus sanguinea* (the latter is due to proximity of Baneasa forest), *Oxalis corniculata*, *Epilobium lanceolatum*, *Wool vulgaris*, *Verbascum blattaria*, *Artemisia absinthium*, *Matricaria perforated*, *Xanthium italicum*, *Lolium multiflorum*.

The characteristic species in the East of the city were: *Kholrauschia prolifera*, *Silene alba*, *Potentilla reptans*, *Elaeagnus angusitfolia* (possibly planted), *Erodium cicutarium*, *Bertheroa incana*, *Ailanthus altissima*, *Verbascum phlomoides*, *Galium mollugo*, *Carlina vulgaris*, *Chondrilla juncea*, *Cirsium pannonicum*, *Cynodon dactylon*, *Hordeum murinum*, *Lolium perenne*.

In both fields, as for the vernal survey, perennial plants are dominant to the annual ones and those from *Hemychryptophyta*, which indicates a climate with a thermal and humidity deficiency.

And in this case Eurasian species are best represented, followed by the cosmopolitan, ranked second in number, again emphasizing the character of the two land ruderalized meadows.

In terms of requirements for soil moisture, 23 of the 47 plant species identified in the North are with moderate demands to this factor (xero-mesophytic); in the East 31 of the 50 species are xerophytes or xero-mesophytes, confirming thus the findings from the vernal survey.

CONCLUSIONS

1. The specific composition of the two pastures from the North and East of Bucharest were similar in number of species and families.
2. In the vernal survey from the East of the City *Poaceae* species are dominated, while in summer most of the *Asteraceae*.
3. *Hemichryptophyta* species prevail in terms of life form, indicating a thermal or humidity deficiency climate and the abundance of *Poaceae* formations.
4. The large number of xero-mesophytes species in both surveys shows the steppe character of the grassland associations, and this is more pronounced in the case of East fields.

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