Systematic and Ecological-cenotic Analysis of Poisonous Plants of the Chechen Republic

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Abstract: In this communication, an ecological-cenotic analysis of medicinal plants of the Chechen Republic is given. This report provides a systematic and ecological-coenotic analysis of poisonous plants in the Chechen Republic. The list of studied species is given. These studies were carried out on the basis of the processing of herbarium materials and field observations of the authors. Poisonous plants are found among various systematic groups: horsetails, club mosses, ferns, gymnosperms and angiosperms.

1 INTRODUCTION

Poisonous plants are plants that produce and accumulate poisons in the process of vital activity that cause poisoning of animals and humans. More than 10 thousand species of poisonous plants are known in the world flora, mainly in the tropics and subtropics. There are many of them in countries with temperate and cold climates, more than 300 species are found in Russia (Orlov, 1990).

Medicinal poisonous plants have been used for centuries, and many cultures still rely on native plants to meet their basic health needs. Poisonous medicinal plants are used to treat various diseases and may have antidiabetic, anti-cancer, antibacterial, antifungal and cytogenetic properties.

2 MAIN PART

This study was conducted in the Chechen Republic in the period from June 2019 to June 2021The research is based on the analysis of field studies and observations of the authors. Route-geobotanical, route-floristic methods were used. The purpose of this review is to provide a report on the systematic and ecological-cenotic analysis of poisonous plants of the republic.

To confirm the stated information, a study of the scientific literature was conducted. A total of 58 plant species belonging to 41 genera and 23 families were identified as poisonous plants. The systematic spectrum of this group of plants is shown in Table 1.

Most of the representatives of these plant species are plants of the *Papaveraceae* Juss*., Euphorbiaceae* Juss. numbering 6 species (10.34%). The second place is occupied by plants of the family *Solanaceae* Juss., *Asteraceae* (5 species, 8.62%). In third place are representatives of the families *Equisetaceae* Rich. ex DC, *Helitropiaceae*, *Cucurbitaceae* Juss. there are 4 species each (6.9%). Then in decreasing number of species are the families *Caprifoliaceae* Juss., *Rhamnaceae* Juss., *Cucurbitaceae* Juss. (3 species each, 5.17%), *Dryopteridaceae* China (*Aspidiaceae*) (2 species, 3.45%), family *Huperziaceae* Rothm., *Takhaseae* S. F. Gray, *Cupressaceae* Rich. ex Bartl., *Ephedraceae* Dumort, *Thymelaeaceae* Juss., *Peganaceae* Engl.Tiegh., *Cannabaceae* Endl., *Cannabaceae* Endl., *Chenopodiaceae* Vent., *Melanthiaceae* Batsch, *Rutaceae* Juss., *Convallariaceae* Horan. (1 species each, 1.72%).

The largest genus Euphorbia (*Tithymalis*) has 5 species, the genus *E guisetum*, *Heliotropium* - 4 species, the genus *Senecio* - 3 species. The vast majority of genera of poisonous plants contain one species, there are 11 such genera. There are 4 genera of two species each.

Representatives of poisonous plants of the Chechen Republic are components of various phytocenoses. The studied species belong to different plant groupings, representing natural florocenoelements. That is, they are ecologically different, more or less constantly confined to certain phytocenoses.

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When analyzing poisonous plants according to the ecological-cenotic parameter, we identified 11 florocenoelements, the spectrum of which is given in Table 2. The number of florocenoelements in the flora is always greater than the number of species, which manifests their ecological plasticity. This position is confirmed by many researchers of the flora of the North Caucasus, who analyzed regional flora (Galushko, 1975; Galushko, 1976; Galushko, 1980; Ivanov, 1996; Ivanov, 1998; Shkhagapsoev, 2002; Khrustalev, 1991) (fig. 1-2).

There are 16 types of forest florocenoelements (22.22%). These are such types as *Hupérzia selágo*

Table 1: Systematic spectrum of poisonous plants of the Chechen Republic.

No.	Family	Number of species	%
1	*Papaveraceae* Juss.	6	10.34
2	*Euphorbiaceae* Juss.	6	10,34
3	*Solanaceae* Juss.	5	8,62
4	*Asteraceae*	5	8,62
5	*Equisetaceae* Rich. ex DC	4	6,9
6	*Helitropiaceae*	4	6,9
7	*Apiaceae* Lindl.	4	6,9
8	*Caprifoliaceae* Juss.	3	5,17
9	*Rhamnaceae* Juss.	3	5,17
10	*Cucurbitaceae* Juss.	3	5,17
11	*Dryopteridaceae* China (*Aspidiaceae*)	2	3,45
12	*Fabaceae* Lindl.	2	3,45
13	*Huperziaceae* Rothm.	1	1,72
14	*Taxaceae* S. F. Gray	1	1,72
15	*Cupressaceae* Rich. ex Bartl.	1	1,72
16	*Ephedraceae* Dumort	1	1,72
17	*Thymelaeaceae* Juss.	1	1,72
18	*Peganaceae* Engl.Tiegh.	1	1,72
19	*Cannabaceae* Endl.	1	1,72
20	*Chenopodiaceae* Vent.	1	1,72
21	*Melanthiaceae* Batsch	1	1,72
22	*Rutaceae* Juss.	1	1,72
23	*Convallariaceae* Horan.	1	1,72
Total		58	100

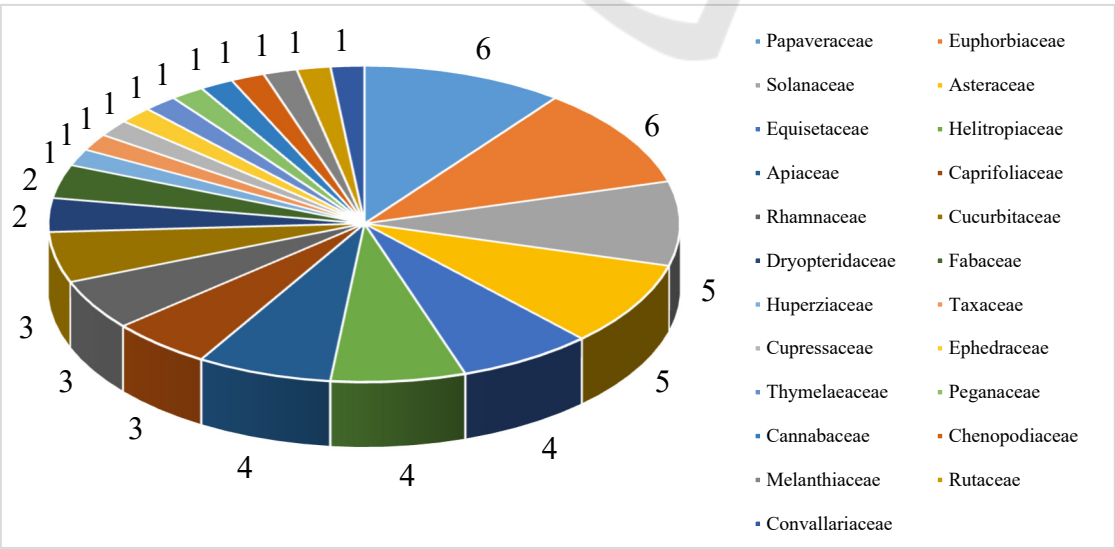

Figure 1: Structure of poisonous plants in the flora of the Chechen Republic.

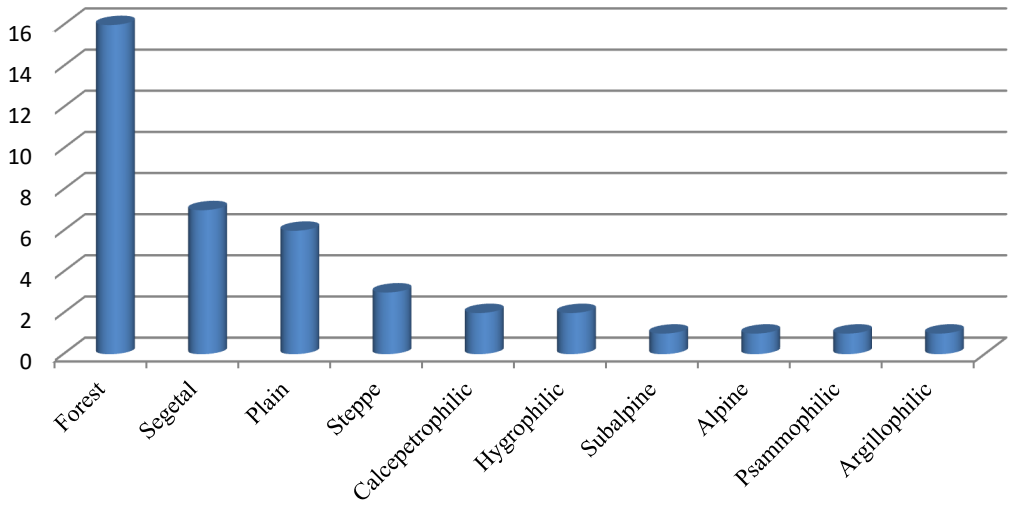

Figure 2: Spectrum of florocenoelements of poisonous plants of the Chechen Republic.

(L.) Bernh. ex Schrank et C. Mart., *Eguisetum fluviatile* L., *Dryopteris filix–mas* (L.) Schott., *Dryopteris assimilis* S.Walker, *Taxus baccata* L., *Melilotus albus* Medic., *Peganum harmala* L., *Heliotropium suaveolens* Bieb., *Heliotropium ellipticum* Ledeb., *Conium maculatum* L., *Aethusa cynapium* L., *Frangula alnus* Mill., *Ricinus communis* L.s.l., *Tithymalis helioscopius* (L.) Scop., *Atropa caucasica Kreyer* (*A. bella-donna* L.), *Convallaria transcaucasica* Utkin ex Grossh. (*C. majalis* L.) (Umarov, 2011).

There are 6 types of lowland florocenoelements (8.33%). These are such types *Eguisetum palustre* L., *Sambucus nigra* L., *Cannabis ruderalis* Janisch., *Euphorbia humifusa* Schlecht., *Tanacetum vulgare* L., *Pyrethrum coccineum* (Willd.) Worosch (Umarov, 2011).

Subalpine florocenoelements are part of subalpine meadows, there is only 1 species (1.39%). This is *Heraculum sibiricum* L. (Umarov, 2011).

There are 1 species of Alpine florocenoelements (1.39%). This is *Heraculum sibiricum* L. (Umarov, 2011).

There are 3 types of steppe florocenoelements (4.17%). These are such types as *Daphne mezereum* L., *Papaver rhoeas* L., *Papaver bracteatum* Lindl. (Umarov, 2011).

There are 2 types of calcepetrophilic florocenoelements (2.78%). These are such types as *Juniperus sabina* L., *Ephedra distachia* L. (Umarov, 2011).

There are 1 type of psammophilic elements (1.39%). This is *Ephedra distachia* L. (Umarov, 2011).

Argillophilic florocenoelements living on clay substrates, only 1 species (1.39%). This is *Papaver arenarium* Bieb. (Umarov, 2011).

Hygrophilic florocenoelements live in places with increased soil moisture. There are 2 such species (2.78%): *E guisetum palustre* L., *Eguisetum pratense* Ehrh. (Umarov, 2011).

There are 7 types of segetal florocenoelements (9.72%). This is *Eguisetum palustre* L., *Eguisetum arvense* L., *Eguisetum fluviatile* L., *Chaerophyllum aromaticum* L., *Heracleum sibiricum* L., *Frangula alnus* Mill., *Papaver arenarium* Bieb. (Umarov, 2011).

There are 32 types of ruderal florocenoelements (44.44%). This is *Melilotus officinalis* (L.) Pall., *Heliotropium. europaeum* L., *Heliotropium. lasiocarpum* Fisch. et Mey., *Sambucus ebulus* L., *Sambucus ebulus* L., *Lonicera steveniana* Fisch.ex Pojark., *Chaerophyllum aromaticum* L., *Heracleum sibiricum* L., *Rhamnus cathartica* L., *Frangula alnus* Mill., *Frangula alnus* Mill., *Papaver arenarium* Bieb., *Papaver bracteatum* Lindl., *Papaver dubium* L., *Chelidonium flavum* Grantz., *Anabasis aphylla* L., *Tithymalis falcatus* (L.), *Tithymalis paluster* (L.), *Tithymalis ibericus* (Boiss.) Prokh., *Euphorbia humifusa* Schlecht., *Tithymalis helioscopius* (L.), *Veratrum lobelianum* Bernh., *Hyoscyamus niger* L., *Solanum nigrum* L., *Scopolia caucasica* Kolesn., *Senecio rhombifolius* (Willd.) Sch. Bip., *Senecio* vernalis Waldst.et Kit., *Senecio*

vulgaris L., *Tanacetum vulgare* L., *Bryonia alba* L., *Bryonia dioica* Jacq., *Ecballium elaterium* (L.) A.Rich. (Umarov, 2011).

Table 2: Phytocenoecological spectrum of poisonous plants of the Chechen Republic.

Florocenoelement	qty florocen o-elements	% of the total number of species
Forest	16	22.22
Plain	6	8.33
Subalpine	1	1.39
Alpine	1	1.39
Steppe	3	4.17
Calcepetrophilic	2	2.78
Psammophilic	1	1.39
Argillophilic	1	1.39
Hygrophilic	2	2.78
Segetal	7	9.72
Ruderal	32	44.44
TOTAL	72	100

The spectrum of phlorocenoelements of poisonous plants of the Chechen Republic is given in Table 2.

3 CONCLUSION

There are 58 species of poisonous plants in the flora of the Chechen Republic. The largest number of species are families *Papaveraceae* Juss., *Euphorbiaceae* Juss. (6 species, 10.34%). Families *Huperziaceae* Rothm., *Takhaseae* S. F. Gray, *Cupressaceae* Rich. ex Bartl., *Ephedraceae* Dumort, *Thymelaeaceae* Juss., *Peganaceae* Engl.Tiegh., *Cannabaceae* Endl., *Cannabaceae* Endl., *Chenopodiaceae* Vent., *Melanthiaceae* Batsch, *Rutaceae* Juss., *Convallariaceae* Horan. have the minimum number of species (one species each). Ecological and cenotic analysis revealed 72 florocenoelements. In the first place are ruderal, in the second place are forest florocenoelements. The smallest are subalpine, alpine, psammophilic and argilogalophilic florocenoelements.

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