

**Ass. *ALCHEMILLO ARVENSIS-MATRICARIETUM* Tx. 37
IN THE WEED VEGETATION OF SKOPJE VALLEY**

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Ass. Alchemillo arvensis-Matricarietum is characteristic of grain crops that are subjected to intensive tillage and application of adequate agricultural and chemical means of protection. This community spreads through the Southern region of Skopje Valley. In the course of a three-year investigation (1998-2000) we determined subass. *alopecuretosum* and described a new geographical variant with *Consolida orientalis*. *Ass. Alchemillo arvensis-Matricarietum* develops mostly on carbonate substrate. Its biological spectrum is dominated by therophytes (66.67 %), while the plant geographical analysis shows its European-Middle-European character (44.00 %) with significant participation of sub-Mediterranean geographic floral elements (17.33 %) resulting from Mediterranean influence on the investigated region.

Key words: weed vegetation, small grain crop, association, subassociation, geographical variant

INTRODUCTION

Weed vegetation in the territory of Skopje Valley has so far been an unresearched region from the phytocoenological aspect. Although the region is

characterized by a great diversity of flora and vegetation, serious research has been lacking so far.

Separate researches of the floristic composition of weed vegetation in different cultures are relevant to maize, cotton, pepper, tomato, peanut (LOZANOVSKI and PIPERKOVSKA, 1992) and rice (LOZANOVSKI *et al.*, 1992). Associations in which weed vegetation appears in the abovementioned territory have therefore been unknown.

The aim of this research is to establish the floristic composition and associations in which the weed vegetation of small grain agrophytocoenosis appears, with detailed analyses of the biological spectrum and plant-geographical relations.

CHIEF CHARACTERISTICS OF THE INVESTIGATED REGION

Skopje Valley (210-850 m al.) with a total surface of 2100 km² (JOVANOVIĆ, 1931) is a heterogeneous structure in floristic and pedological terms. It is an area with a typical transitional climate combining sub-Mediterranean and East continental influences (MAVRODIEV, 1970). The lowest zone of up to 300 m al. has a surface of 370 km², or 1/5 of total Valley territory, which is influenced by a modified sub-Mediterranean climate.

METHOD

Phytocoenological researches were conducted according to the BRAUN-BLANQUETT (1964) combined scale for abundance and plant coverage. In taxa determination we used determinators by HAYEK (1924-1933), TUTIN *et al.* (1964-1993), MICEVSKI (1985, 1993, 1995, 1998, 2001) and HEGI (1939), with reference to the Serbian Flora (JOSIPHOVICH ed. 1970-1986) and a seed determinator (DOBROHOTOV, 1961). Coenological classification of taxa is given according to OBERDORFER (1968, 1993) and formulation of new syntaxonomic categories according to idiotaxonomic and syntaxonomic definitions, concepts and methods proposed by WESTHOF and VAN DER MAAREL (1978, in WHITTAKER ed.), DIERSCHKE (1994), OBERDORFER (1968), and MATUSZKIEWICZ (1981).

Plant-geographical relations within association were established according to GAJIĆ (1980), while weed life-forms are based on RAUNKIAER's concept 1934 (KOJIĆ *et al.*, 1983).

RESULTS AND DISCUSSION

The researched weed vegetation consists of ass. *Alchemillo arvensis-Matricarietum* Tx. 37. Syntaxonomic differentiation (OBERDORFER, 1993) shows the established community to belong to:

	<i>Thlaspi alliaceum</i>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	</
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On localities with established ass. *Alchemillo arvensis-Matricarietum*, we found abundant presence of *Alopecurus myosuroides* (IV) and *Avena sterilis* subsp. *ludoviciana* (V). Strong influence of the modified sub-Mediterranean climate is reflected in the presence of *Consolida orientalis* (IV), which is part of the Mediterranean-Sub-Mediterranean floral element, and *Galium tricornutum* (III), which belongs to the Sub-Mediterranean.

A small number of taxa, of which only *Papaver dubium* appeared with the II degree of constancy, represents the alliance *Aperion spica-venti*. All other taxa: *Equisetum arvense*, *Veronica tryphyllos*, *Bromus commutatus*, *Papaver argemone*, *Veronica hederifolia*, *Legousia speculum-veneris* and *Apera spica-venti*, as typical for the alliance, are present in one relevés alone (I). The order *Aperetalia spica-venti* is poorly characterised and differs from *Secalinetalia Mediterranea*, which is relatively well characterised by *Galium tricornutum* (III), *Centaurea cyanus* (II) and *Vicia pannonica* subsp. *striata* (II). From the syntaxonomic aspect ass. *Alchemillo arvensis-Matricarietum* belongs to class Secalietea, which is represented by a great many taxa with the dominant *Convolvulus arvensis* (V), *Papaver rhoeas* (IV) and *Agrostemma githago* (III). Ass. *Alchemillo arvensis-Matricarietum* is characterised by the occurrence of taxa that determine the order *Polygono-Chenopodietalia albi* (MOCHNACKÝ, 1984) as well as *Sisymbrietalia* as a result of the surrounding autochthonous flora.

In the phase of optimal growth and development, a clearly expressed verticality can be recognised in the association. The low layer (0-20 cm) is composed of the following taxa *Chamomilla recutita*, *Bilderdykia convolvulus*, *Polygonum aviculare*, *Chenopodium album*, *Stellaria media*, *Anagallis arvensis*, *Veronica acinifolia* and *Fumaria vaillantii*. The middle layer (20-60 cm) consists of: *Alopecurus myosuroides*, *Papaver rhoeas*, *Galium aparine*, *Cardaria draba*, *Melilotus officinalis*, *Consolida regalis*, *Papaver dubium*, *Vicia sativa* subsp. *sativa*, *Lithospermum arvense*, *Ranunculus arvensis*, *Centaurea cyanus* and *Vicia pannonica* subsp. *striata*. Finally, the upper layer is composed of plants higher than 60 cm, such as *Avena sterilis* subsp. *ludoviciana*, *Convolvulus arvensis*, *Consolida orientalis*, *Sinapis arvensis*, *Galium tricornutum*, *Agrostemma githago*, *Vaccaria pyramidata* and *Bromus sterilis*.

Optimal synphenological development of ass. *Alchemillo arvensis-Matricarietum* was achieved in the second ten days of May and lasted until the second ten days of June when, as different other taxa, it is characterised by the phase of full flowering and beginning of fruit bearing.

Ass. *Alchemillo arvensis-Matricarietum* developed on carbonate soils, but also on a few localities that are carbonate-free. The main characteristic of the localities where the association was found is the fact that all of them are fertile and regularly tillaged soils, not rarely loamy with a high water-retaining capacity (OBERDÖRFER, 1957; WALTHER, 1969; OESAU, 1973; MOCHNACKÝ, 1984; ALBRECHT, 1989; HÜPPE and HOFMEISTER, 1990; OBERDÖRFER, 1993). Ass. *Alchemillo arvensis-Matricarietum* develops well on terrains that have low inclination (2-10°), different exposition and altitude ranging from 210 to 280 m. pH-reaction of soil solution is moderately alkaline (7.90-8.60), slightly alkaline (7.60) and rarely neutral (6.60).

The analysis of life-forms shows that the biological spectrum of the association (Figure 1) is dominated by therophytes (66.67 %), while chamaephytes, hemicryptophytes and geophytes are represented with low percentages (16.00 %, 9.33 %, and 8.00 %, respectively).

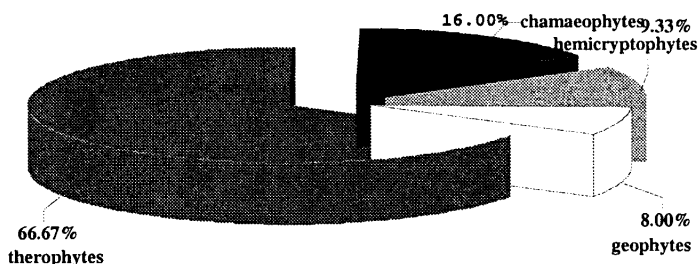


Figure 1. - The spectrum of life forms of ass. *Alchemillo arvensis-Matricarietum* Tx. 37 association

Ass. *Alchemillo arvensis-Matricarietum* is widespread throughout Central Europe. Consequently, Middle-European and European floral elements account for as much as 44.00 %. A significant influence of the modified sub-Mediterranean climate that touches on the researched territory resulted in 17.33 % presence of Sub-Mediterranean floral elements. The group of Pontic floral elements account for 14.67 % of the total floristic spectrum, Circumpolar and Sub-Circumpolar for 5.33 %, Sub-Atlantic-sub-Mediterranean for 2.67 %, Sub-Atlantic-sub-Mediterranean for 2.67 %, Cosmopolitan for 12.00 % and Adventive for 4.00 % (Figure 2).

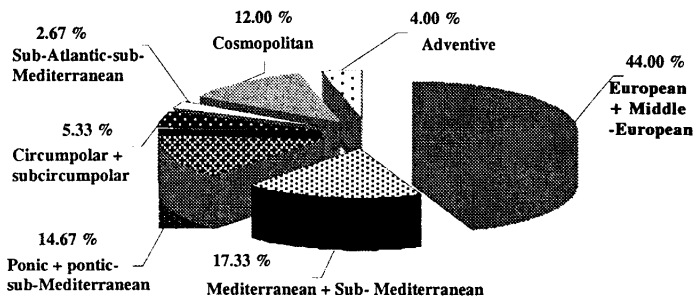


Figure 2. - Spectrum of flora element of ass. *Alchemillo arvensis-Matricarietum* Tx. 37

Depending on soil characteristics and humidity, ass. *Alchemillo arvensis-Matricarietum* may be differentiated into subass. *alopecuretosum* that typically develops in the association and tends in development towards alliance *Caucalidion lappulae* (OBERDORFER, 1993). This fact is based on the presence of taxa that are characteristic of the mentioned alliance, such as *Consolida regalis*, *Vaccaria pyramidata*, *Veronica acinifolia*, *Fumaria vaillantii* (II) and *Neslia paniculata* (I).

Subass. alopecuretosum Oberd 57

(Tab.1/1-9)

Ass. *Alchemillo arvensis-Matricarietum* subass. *alopecuretosum* Oberd 57 develops on carbonate substrate with a high percentage of loamy soil that has almost alkaline soil pH-reaction (7.90-8.00) and on 210-250 m altitude. On the researched territory the subassociation is characterised by *Alopecurus myosuroides*, which appears in 75.00 % of the phytocoenological relevés with a high degree of constancy (IV) (Table 1).

Var. geogr. *Consolida orientalis* var. geogr. nova

(Tab. 1/4-11, nom. type 1/4)

According to the analytical table (Table 1) and as a result of the Mediterranean influence that resulted in a modified Sub-Mediterranean climate, the floristic composition of the association includes *Consolida orientalis* as the Mediterranean-Sub-Mediterranean floral element in 66.67 % of the relevés. The

newly-established geographical variant is characteristic of the researched territory and developed on carbonate and carbonate-free soils with pH-reaction which is moving from slightly alkaline (7.60) and moderately alkaline (7.90-8.00) to neutral (6.60) in most cases. The geographical variant with *Consolida orientalis* may thus be considered to have a wide ecological valence. Similarly with the association, this geographical variant occurs in lowlands from 225 to 280 m altitudes.

CONCLUSION

The conducted phytocoenological, syntaxonomic, chorological and ecological researches of weed vegetation in the phytocoenosis of small grain crops in the territory of Skopje Valley incited the following conclusions:

Weed vegetation in small grain crop is affiliated to ass. *Alchemillo arvensis-Matricarietum* Tx. 37, suballiance *Aphanenion* Oberd. 93, alliance *Aperion spica-venti* Tx. in Oberd. 49, order *Aperetalia spica-venti* J. et R. Tx. in Mal.-Bel. et al. 60 and class *Secalietea* Br.-Bl. 52.

The research determined subass. *alopecuretosum* and established a new geographical variant with *Consolida orientalis*.

Ass. *Alchemillo arvensis-Matricarietum* consists of 76 species; the most represented in its biological spectrum are therophytes (66.67 %), while the geographical floral analysis indicated a domination of the Middle-European and European floral elements in 44.00 % of the spectrum.

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Ass. *ALCHEMILLO ARVENSIS-MATRICARIETUM* Tx. 37 U KOROVSKOJ VEGETACIJI SKOPSKE KOTLINE

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I z v o d

Ass. Alchemillo arvensis-Matricarietum R. Tx. 37 je karakteristična za useve strnih žita gde se adekvatno primenjuju agrotehničke i hemijske mere zaštite. Ova zajednica je rasprostranjena u južnim regionima Skopske kotline. U toku trogodišnjih istraživanja je potvrđena subass. *alopecuretosum*, a opisana nova geografska varijanta sa *Consolida orientalis*. Ova zajednica se razvija u najvećem broju snimaka na karbonatnom substratu. U njenom biološkom spektru dominiraju terofite (66,67%), a sa biljno-geografskom analizom je potvrđen njen evropsko-srednje-evropski karakter (44,00 %) sa znatnim učešćem submediteranskih flornih elemenata (17,33%), kao rezultat uticaja Mediterana na ovom području.

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