SPECIES COMPOSITION OF VEGETATION IN WINE VILLAGE BRATČICE AND SYROVICE

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Abstract: The purpose of this work is to compile a list of species growing in vineyards of two wine villages Bratčice and Syrovice, Znojmo wine subregion. Within the wine village of Bratčice, vine line Široké klinky. Within the wine village of Syrovice there were evaluated 2 vine lines: Stará hora and Nad mlýnem. In Široké klínky (wine village of Bratčice) was the most species rich vegetation within evaluated vine lines, 46 plant species were found. Whereas 40 plant species were found in Stará hora vine line (wine village of Syrovice) and only 17 species were found in Nad mlýnem vine line (wine village of Syrovice). The most frequently occurred species were grasses as: *Lolium perenne, Festuca rubra, Festuca pratensis, Arrhenatherum elatius*.

Key Words: vegetation, vineyards, plant species, Bratčice, Syrovice

INTRODUCTION

The grapevine cultivation in our country is known since the 3rd century AD. The roman emperor Mark Aurelius had planted the vineyards near the village of Mušov, now no longer exist, under the Pálava hills. From the first vineyards the vine spread all over South Moravia (Pátek 1998). In 2015, the total vineyard area amounted to 17.700 ha (Bublíková 2016). Of this total, the organically farmed 1 025 hectares (Ekologické zemědělství v ČR 2016).

The basic nature of viticulture in the 21st century is to maintain and above all the increase in the natural fertility of the soil. Soil fertility is determined by the positive interaction of matter rock, humus, soil organisms and organic matter. Soil fertility is the soil's ability to supply higher plants enough of air, water, nutrients and they create an environment to fixing roots. The complete exclusion or minimal application of pesticides that are toxic to individual components of soil edaphone and the greening of vineyard interconnections are very important elements of soil care (Pavloušek 2007). The greening of the vineyards is closely related to the expansion of organic vine farming and expanding integrated production (Hrabalová 2016).

According to Pavloušek (2011) we use a wide spectrum of plant species to plant vineyards. Appropriate species used for planting the vineyard are sought according to pH, soil structure, humus, exposition, planting space, vine varieties, cutting, planting time and passage frequency (Sedlo 1994).

The structure of the soil in the vineyards is permanently distorted one-sided treatment of the soil in the long term and leads to soil compaction. Significant problems are caused by the lack of humus. Looking at these aspects, new greenhouse compounds are mixed. It is contain a rich representation of individual families. These are families of *Brassicaceae*, *Fabaceae*, *Poaceae*) and other dicotyledonous flowering herbs (Ziegler 2004).

The main principles of the seed mixtures include representations of at least three kinds of different genera. Another principle is that grass species can not be dominant (less than 50%). At least 33% must be leguminous plants. The mixture must also appear 1–2% deep rooting plants. Sufficient space must be left with natural flora (Ziegler 2004).

The purpose of this work is to compile a list of species growing in vineyards of the wine villages Bratčice and Syrovice. Other purpose of this work is to evaluate the importance of plant species in terms of vine growing and ecosystem.

MATERIAL AND METHODS

Characteristics of the interest territory Bratčice

The cadastral area of Bratčice is located in the South Moravian Region, about 20 km south of Brno. The altitude is approximately 215 m a.s.l. The area falls into a very warm and dry climatic region within the Czech Republic.

The total area of the Bratčice cadastral area is 616.9 ha, of which the agricultural land is 505.9 ha. Within agricultural land, arable land is 484.8 ha, meadows and pastures 8.1 ha, orchards 0.3 ha and vineyards 1.9 ha.

The Bratčice village is governed by the wine law as a wine village belonging to the Znojmo wine subregion and the wine region of Moravia. Within the wine village there are 2 vine lines of the Staré hory and Široké klinky. Staré hory is not currently planted with vineyards and therefore have not been evaluated.

Characteristics of the interest territory Syrovice

The cadastral area of Syrovice is located in the South Moravian Region, about 20 km south of Brno. The altitude is approximately 202 m a.s.l. The area falls into a very warm and dry climatic region within the Czech Republic.

The total area of the Syrovice cadastral area is 881.5 ha, of which the agricultural land is 707.9 ha. Within agricultural land, arable land is 673.2 ha, meadows and pastures 1.1 ha, orchards 1.6 ha and vineyards 11.8 ha.

The Syrovice village is governed by the wine law as a wine village belonging to the wine region of Moravia and the Znojmo wine subregion. Within the wine village there are 2 vine lines of the Stará hora and Nad mlýnem.

Methodology of evaluation of vegetation species composition

Evaluation of vegetation was made using a floristic list of the found species. Evaluation was made in July 2016. Scientific names of individual plant species were used according to Kubát et al. (2002), categories of plant rarity and endangerment follow redlist of Grulich (2012). Inspection routes were determined on the selected territories within the wine lines. The found species were registered during the 3 inspections. Occurrence of each recorded species was evaluated using a simple three-point scale after completion of the inspections.

Scale evaluating occurrence of species:

- 3 – very frequently occurring species with dominant occurrence (dominant species)
- 2 – common species with frequent occurrence on some parts on the vineyard only (sub-dominant species)
- 1 – rare species with rare and sporadic occurrence

RESULTS AND DISCUSSION

List of plant species found on rated vineyards

The first evaluated area was the vine lines Široké klínky (wine village Bratčice). Most of the line area is consist of arable land and there are small parts of vineyards. A similar cultivation method is applied to the entire vineyard. On this plot is used alternating cultivated and grassed inter-rows. During the monitoring, 46 plant species were found on this track.

Among the species with very abundant occurrence on this track belong (level 3 according to the scale): *Achillea millefolium*, *Amaranthus retroflexus*, *Convolvulus arvensis*, *Conyza canadensis*, *Hordeum murinum*, *Lolium perenne*, *Mercurialis annua* and *Trifolium repens.*

The common occurrences on this track were (level 2 according to the scale): *Atriplex patula, Bromus hordeaceus, Cirsium arvense, Consolida regalis, Dactylis glomerata, Echinochloa crus-galli, Euphorbia helioscopia, Festuca pratensis, Festuca rubra, Chenopodium album, Lamium album, Lathyrus tuberosus, Malva neglecta, Setaria viridis, Stellaria media* and *Tripleurospermum inodorum.*

Species with a rare or rare occurrence on this track were (level 1 according to the scale): *Avena fatua, Bromus tectorum, Carduus acanthoides, Carex hirta, Elytrigia repens, Galium aparine, Geum urbanum, Humulus lupulus, Panicum miliaceum, Papaver rhoeas, Pastinaca sativa, Plantago lanceolata, Plantago major, Reseda lutea, Robinia pseudacacia, Senecio vulgaris, Taraxacum* sect. *Ruderalia, Tragopogon orientalis, Triticum aestivum, Urtica dioica, Urtica urens* and *Veronica persica.*

The second evaluated area was the vine lines Stará hora (wine village Syrovice). On the territory of this line, the vineyards are also only partially and most of the area is used in a different way. These are mainly vineyards that are part of gardens or small plots and are mostly managed by small breeders. On this plot is used cultivated inter-rows with intensive regulation of vegetation. During the monitoring, 40 plant species were found on this track.

Among the species with very abundant occurrence on this track belong (level 3 according to the scale): *Amaranthus retroflexus, Cirsium arvense, Convolvulus arvensis, Elytrigia repens, Festuca pratensis, Festuca rubra* and *Lolium perenne.*

The common occurrences on this track were (level 2 according to the scale): *Agrostis capillaris, Apera spica-venti, Artemisia vulgaris, Bromus tectorum, Conyza canadensis, Erigeron annuus, Chenopodium album, Plantago lanceolata, Setaria viridis, Securigera varia, Trifolium repens* and *Tripleurospermum inodorum.*

Species with a rare or rare occurrence on this track were (level 1 according to the scale): *Achillea millefolium, Arrhenatherum elatius, Carduus acanthoides, Cornus sanguinea, Echinochloa crus-galli, Echinops sphaerocephalus, Eryngium campestre, Galeopsis tetrahit, Geranium pusillum, Chenopodium strictum, Juglans regia, Lamium purpureum, Lappula squarrosa, Mercurialis annua, Rosa canina, Silene vulgaris, Taraxacum sect. Ruderalia, Thlaspi arvense, Trisetum flavescens, Urtica dioica* and *Verbascum austriacum.*

The third evaluated area was the vine lines Nad mlýnem (wine village Syrovice). Most of the line area is consist of arable land, orchards, gardens and vineyards. During the monitoring, 17 plant species were found on this track.

Among the species with very abundant occurrence on this track belong (level 3 according to the scale): *Arrhenatherum elatius, Bromus tectorum, Dactylis glomerata, Festuca pratensis, Festuca rubra* and *Trisetum flavescens.*

The common occurrences on this track were (level 2 according to the scale): *Aethusa cynapium, Achillea millefolium, Erigeron annuus, Fragaria moschata, Medicago lupulina, Reseda lutea, Robinia pseudacacia* and *Trifolium repens.*

Species with a rare or rare occurrence on this track were (level 1 according to the scale): *Cirsium arvense, Erigeron acris* and *Medicago minima.*

Evaluation of plant species occurrence in monitored vine lines

Of the plant species found, some effectively prevent erosion. Such species belong *Lolium perenne, Festuca rubra, Festuca pratensis, Elytrigia repens, Securigera varia, Trifolium repens, Agrostis capillaris, Arrhenatherum elatius, Achillea millefolium, Dactylis glomerata* and *Trisetum flavescens.*

Some species bind atmospheric nitrogen and thus enrich the soil. Such species belong *Trifolium repens, Securigera varia, Lathyrus tuberosus, Robinia pseudacacia, Medicago minima* and *Medicago lupulina.*

Some species are very attractive to insects as a food source. Such species belong *Securigera varia, Tripleurospermum inodorum, Trifolium repens, Plantago lanceolata, Plantago major, Artemisia vulgaris, Erigeron annuus, Erigeron acris, Conyza canadensis, Echinops sphaerocephalus, Carduus acanthoides, Verbascum austriacum, Lamium album, Lamium purpureum, Geranium pusillum, Galeopsis tetrahit, Eryngium campestre, Taraxacum* sect. *Ruderalia, Rosa canina, Achillea*

millefolium, *Silene vulgaris*, *Lappula squarrosa*, *Fragaria moschata*, *Reseda lutea*, *Medicago lupulina*, *Medicago minima*, *Robinia pseudacacia*, *Cirsium arvense*, *Lathyrus tuberosus*, *Consolida regalis*, *Stellaria media*, *Tragopogon orientalis*, *Papaver rhoeas*, *Aethusa cynapium*, *Pastinaca sativa*, *Veronica persica* and *Senecio vulgaris*.

Some species have very deep roots and can compete with grapevine. Such species belong *Convolvulus arvensis*, *Securigera varia*, *Humulus lupulus*, *Juglans regia*, *Cirsium arvense*, *Artemisia vulgaris*, *Robinia pseudacacia*, *Taraxacum* sect. *Ruderalia*, *Rosa canina*, *Lathyrus tuberosu* and *Pastinaca sativa.*

Some species quickly produce a large amount of biomass, which complicates the work in the vineyard. Such species belong *Hordeum murinum*, *Amaranthus retroflexus*, *Setaria viridis*, *Tripleurospermum inodorum*, *Echinochloa crus-galli*, *Atriplex patula*, *Chenopodium album*, *Chenopodium strictum*, *Bromus tectorum*, *Bromus hordeaceus*, *Avena fatua* a *Galium aparine.*

CONCLUSION

During the monitoring of vineyard vegetation of selected wine villages, most species were found in vine line of Široké klínky (wine village of Bratčice). It was found 46 plant species. In vine line of Stará hora were found 40 plant species. The least species was found on the Nad mlýnem vine line (wine village of Syrovice). It was found 17 plant species.

The most frequently occurring species of weed were: *Lolium perenne*, *Festuca rubra*, *Festuca pratensis*, *Arrhenatherum elatius*, *Trisetum flavescens*, *Elytrigia repens*, *Hordeum murinum*, *Dactylis glomerata*, *Bromus tectorum*. The other most frequently occurring species of herbaceous perennial plant were: *Trifolium repens*, *Achillea millefolium*, *Cirsium arvense*, *Convolvulus arvensis*, *Conyza canadensis*. And from annual herbs were the most frequently occurring species: *Mercurialis annua* and *Amaranthus retroflexus*.

At present, the vineyards are perceived as a plant association, where other plant species grow next to the grapevine. Occurrence of many species of plants prevent erosion, provide food insects and vertebrates, and enriches the soil with nitrogen.

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