Mendel University in Brno
Czech Society of Landscape Engineers – ČSSI, z.s.

Public recreation and landscape protection – with environment hand in hand!

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Faculty of Forestry and Wood Technology
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of doc. Ing. Tomáš Vrška, Dr., the Director of Training Forest Enterprise Masaryk Forest Křtiny, Mendel University in Brno,
of Ing. Dalibor Šafařík, Ph.D., the Chief Executive Office, Forests of the Czech Republic,

of Mgr. Jan Grolich, the Governor of South Moravia,

of PhDr. Ivan Bartoš, Ph.D., Minister of Regional Development of the Czech Republic,

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Contents

FLORA OF SOUTH MORAVIAN VINEYARDS AND THE EDUCATION OF THE ELDERLY CITIZENS

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Abstract

Vegetation surrounds and accompanies us at every step. Vineyards are a specific landscape element typical for South Moravia. From a botanical point of view vineyards are a very distinctive environment which is also reflected in their species variety. Species with common occurrence as well as weeds can be found in the vineyards. Endangered species, and on other hand invasive species also form a part of vineyards. The diversity of vineyard vegetation can be used in the education of elderly citizens. Human senses such as sight, touch and smell can be used to identify plant species. Physical movement, learning about the plant traits and employment of human senses motivate human memory and evoke memories. Wide-ranging stimulation enables better memorization of new information. Learning about the vegetation of the vineyards provokes diverse interactions that are very important in the education of elederly citizens. The combination of exercise and education is an interesting option for recreation of elderly citizens.

Keywords: vegetation, vineyards, University of the Third Age, education, recreation of elderly citizens.

Introduction

The species spectrum of vegetation in vineyards is influenced by location, climatic and soil conditions, method of protection (Winter et al., 2018), maintenance of rows and inter-rows (Kratschmer et al., 2018), and by the size of the vineyards as well as neighbouring habitats (Ragasová et al., 2019). Vineyard management can alter ecosystem services (Winkler et al., 2018). The plant species composition of the orchard vegetation is decisive for ensuring ecosystem functions (Vignozzi et al. 2019; Pfiffner et al. 2019; Denan et al. 2020; Sofo et al. 2020). The protection of native and rare plant species belongs to important ecosystem functions of traditionally managed vineyards (Von Hase et al., 2010). A high species diversity of vegetation creates a prerequisite for a successful provision of these functions. Vegetation is part of vineyards and provides ecosystem functions, and cultural services (Fagerholm et al. 2016, Winkler et al. 2023). Vineyards and fruit trees have aesthetic and cultural values, they carry the legacy of our ancestors who bred varieties and planted them (Baumgärtner and Bieri 2006).

Vineyards and wine cellars in South Moravia are a frequent destination for tourists. Interest in wine tourism keeps growing which contributes to the development of tourism and services. Wine tourism in South Moravia helps preserve local traditions and folklore in wine-growing villages (Prokeš 2013). The diverse vegetation of the vineyards brings also new potential to education.

Teaching about plant species should have a high priority especially in the context of global biodiversity loss (Pernat, et al. 2023). Learning to identify plant species requires time and patience, and also an expert mentor who can provide feedback and ensure improvement (Pearson et al. 2011). Various mobile applications can stimulate interest in learning about plants more easily and directly. This is also one of the main tasks of these applications, which is to motivate the general population to be interested in the environment and its protection (Bonnet et al. 2020). Learning to identify one or more groups of species is a lengthy process that cannot be shortened even by digitization. Human experts are extremely important, also for application capabilities, such as the verification or image labeling for the purpuse of increasing accuracy

(Wäldchen et al. 2018). Teaching in the field confronts students and mentor with different conditions such as vegetation phenology and seasonal appearance of plant species (Pernat, et al. 2023). In the education of elderly citizens, it is important to consider not only their needs and interests, but also their specific desires, fears, lack of previous experience or physical limitations. Awareness of the needs and motivations of elderly citizens in education need to be taken into account when designing study programs. It is essential to create sustainable and long-term implementation of programs for older adults in subsequent years (Schirmer et al. 2023).
The aim of the work was to assess the vegetation potential of selected vineyards for the education of elderly citizens.

Materials and methods
The vineyard, where the field part of the work was carried out, is located in Žabčice, about 25 km south of the city of Brno in the district of Brno – venkov. Žabčice is a wine-growing village in the Velkopavlovice wine sub-region (vineyards: Staré vinohrady; Horní díly; Koválov; Čtvrtky and Zahrádky). The average altitude is 184 m above sea level. The long-term average of total precipitation is 480 mm. The average annual temperature is 9.2 °C.
Vegetation was evaluated using a floristic inventory of the identified species. The evaluation was carried out in June 2023. The paths through the vineyards were determined in the selected area within the wine lines. During passing the paths, the identified plant species were recorded. Subsequently, the plants were divided into functional groups for individual vineyards.

Results
A total of 96 plant species were identified on the vineyard lines during passing the paths through the vineyards.
In total, 64 different plant species were identified on the vineyard line of Stará Vinohrady. Rare plant species included *Filago vulgaris, Melica transsilvanica*, *Lappula squarrosa*, and *Cynoglossum montanum*. Several expansive and invasive species were also identified, which were *Amaranthus retroflexus, Tripleurospermum inodorum, Arrhenatherum elatius, Cirsium arvense, Robinia pseudacacia, Calamagrostis epigeos,* and *Epilobium ciliatum*. Several deep-rooting species were further identified, including *Securia varia, Humulus lupulus, Cirsium arvense, Rosa canina* and *Convolvulus arvensis.*
A total of 54 different plant species were recorded in the form of a floristic record on the Kovál vineyard line. Following rare species were recorded: *Filago vulgaris* and *Lappula squarrosa*. Several expansive and invasive species were also identified in this vineyard. These included *Tripleurospermum inodorum*, *Echinochloa crusgali*, *Urtica dioica*, *Arrhenatherum elatius*, *Cirsium arvense,* and *Calamagrostis epigeos*. Several deep-rooting weeds were identified and included *Securia varia, Amaranthus retroflexus, Parthenocissus quinquefolia, Cirsium arvense, Rosa canina, Cornus sanguinea,* and *Convolvulus arvensis.*
The last monitored vineyard line was the vineyard line Horní Díly, where 71 plant species were recorded. Identified rare species were *Melica transsilvanica* and *Lappula squarrosa*. Following expansive and invasive species were *Amaranthus retroflexus*, *Sambucus nigra*, *Tripleurospermum inodorum*, *Echinochloa crus-gali*, *Urtica dioica, Chenopodium pumilio*, *Arrhenatherum elatius, Cirsium arvense, Robinia pseudacacia, Calamagrostis epigeos, Epilobium ciliatum,* and *Solidago canadensis*. Several deep-rooting plants *Sambucus nigra, Cichorium intybus, Trifolium pretense, Rubus sp., Cirsium arvense, Rosa canina, Convolvulus arvensis,* and *Robinia pseudacacia* were also identified.

Discussion
Educational practices supporting a continuous development and a healthy learning environment in which knowledge is co-created and shared are referred to as sustainable learning (Cascio et al. 2014). They involve continuous, responsive, purposeful and proactive learning where students effectively build and transform their skills and knowledge base through a changing environment (Hays, Reinders, 2020). Part of the duty of sustainable education is to follow current educational processes (Gómez-Galán et al. 2020), where teachers still play a key role in shaping students' interest and success in education (Fauth et al. 2019).
Vineyards are an important element in cultural landscape. Part of the vineyards consist of specific vegetation that grows together with the grapevine. Vegetation in vineyards is highly

important as it provides ecosystem functions to the soil, the vineyards and people. These include e.g. a food source for pollinators, oxygen production and enrichment of the soil with atmospheric nitrogen. Vegetation also prevents wind and water erosion, unwanted evaporation and regulates the occurrence of pathogens and pests. Some types of plants can be used for medicinal purposes. Last but not least, vegetation provides aesthetic services that increase the tourist attractiveness of the locality.

Conclusion

The vegetation in the vineyard represents a very interesting teaching space for the education of elderly citizens. The variety of vineyard vegetation can be used in the education of elderly citizens. People use senses such as sight, touch and smell to identify plant species. Physical movement, learning about the traits of plants and using the human senses motivates the human memory and evokes memories. Wide-ranging stimulation enables better memorization of new information. Learning about the vegetation of the vineyards provokes diverse interactions that are very important in the education of elderly citizens. The combination of exercise and education is an interesting option for recreation of elderly citizens.

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Souhrn
Vegetace nás obklopuje a doprovází na každém kroku. Vinice jsou specifickými krajinným prvkem typickým pro jižní Moravu. Z pohledu rostlin jsou vinice velmi specifickými prostředím a to se odráží v druhové pestrosti. Ve vinicích nacházím druhy s běžným výskytem, jsou zde také druhy označované za plevele. Součástí vegetace vinic jsou ohrožené druhy, ale také druhy invazní. Rozmanitost vegetace vinic může být využita ve vzdělávání seniorů. K identifikaci druhů rostlin jsou využívány lidské smysly jako zrak, hmat a čich. Fyzický pohyb, poučení o znacích rostlin a využití lidských smyslů motivuje lidskou paměť a vyvolává vzpomínky. Mnohostranná stimulace umožňuje lepší zapamatování nových informací. Poznávání vegetace vinic vyvolává různorodé interakce, které jsou velmi důležité ve vzdělání seniorů. Kombinace pohybu a vzdělávání představuje zajímavou variantu pro rekreaci seniorů.

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