

INDICATORS FOR INVESTIGATING TRADITIONAL HOME-GARDENS IN ROMANIA - VINEYARDS, FRUIT TREES AND CULTIVATED SHRUBS DIVERSITY IN MOȘNA COMMUNE, SIBIU COUNTY

Maria-Mihaela ANTOFIE, Camelia SAND SAVA

“Lucian Blaga” University of Sibiu, Faculty of Agricultural Sciences, Food Engineering and Environment Protection, 7-9 Dr. Ioan Ratiu, 550012, Sibiu, Sibiu county Romania
E-mails: mihaela.antofie@ulbsibiu.ro, camelia.sand@ulbsibiu.ro

Corresponding author: mihaela.antofie@ulbsibiu.ro

Abstract

Home-gardens survived in many villages in Romania especially in the historical province of Transylvania and the rich diversity of species and their varieties recorded for vineyards, fruit trees and shrubs may further contribute to define the concept of traditional home-gardens. More than other cultivated species, vineyards and fruit trees that are positioned inside, or outside urban areas, are connecting these agro-ecosystems to the wild ecosystems in a very specific landscape, making possible the preservation of an impressive number of wild species diversity for the region. The scope of this article is to record and discuss the diversity of domesticated species and their varieties related to three groups of plant species such as following: vineyards, fruit trees and shrubs in Moșna commune, Sibiu county, Romania. Our results revealed that even the vineyards decreased 23 times compared to 1750, local community continued to cultivate the first hybrids that have been introduced after the first attack of Phylloxera during the 19th century. Fruit tree species were also recorded in fossils excavated from human settlements in South Eastern Transylvania, the fruit diet being almost unchanged for so many centuries. This is the case also for bushes species that are towering all traditional home-gardens inside urban areas. However, the population expressed an obvious openness for testing and integrating new varieties, new species as well to preserve all old inherited plant genetic resources for centuries supporting us to further define a new type of gastronomic footprint in the support of food security for the future.

Key words: traditional home-gardens, vineyards, fruit trees, shrubs, food security

INTRODUCTION

The diversity of plant genetic resources for food and agriculture (PGRFA) is not only related to crops but also to species that are contributing to completing the human diet [3]. Food security for the future became more and more acutely discussed on higher political agenda due to the overconsuming rate and climate change effects [9]. As a consequence, the pressure to ensure food security for the future rests nowadays on developing PGRFA based on the full free access of Gene banks such as that of Svaldberg from Norway as real gene collections [17]. However, the major impediment is that gene banks are only capturing features of species' genomes for a specific time frame and are losing the connectivity to the evolution of environmental factors [12]. Therefore, for improving our access to genetic resources *on farm* conservation should also support the global

care for PGRFA and the incredible work done in gene banks for the long-term preservation of crops germplasma [16]. At the global level, the World Food Programme (WFP) was recently awarded with the Nobel Price mainly due to *its efforts to combat hunger, and fight for food security for more than 30 years* [10]. However, efforts should be done at the global level and by every country to ensure the full and free access to PGRFA as well as the continuation of taking care of the traditional knowledge (TK) evolution in every single indigenous or local community for ensuring all attributes development in the fight for ensuring food security for long-term [14]. After the Second World War, the extraordinary evolution of human civilization left behind the rural civilization in many places at the global level compared to a sharp evolution into the urban civilization. No matter of governmental policies or natural

disasters a major negative impact was recorded on rural communities: either their transformation in peri-urban areas by transferring urban attributes to rural communities either their continuous impoverishment [13]. Lessons can be learned from both when local communities' resilience is facing climate change or natural disasters [15]. Where to start our quest? It should start from the ground or directly from the field. And, it is compulsory that we need to understand all values of rural civilizations and moreover to further support their TK process as a continuous generation and evolution that is essential for their existence by adding concepts such as food security and resilience to the evolution of our civilization as it is accepted today [18]. In our efforts to continue our saga related to the survey of traditional home-gardens of Sibiu in Romania, aside crops we need to add also other integrated species. Thus, by taking into consideration the complete diet of the XVIII century we need to add also fruits producing species such as vineyards, fruit trees and bushes. These are well documented by the archaeologist finding in archaic human settlements fossilized seeds of fruits or remains of them [4; 6; 7]. The mentioned researchers found fruits remains of domesticated as well as wild species to be used in the archaic diet for more than 6.000 years BC. All these archaic PGRFA will be relevant for the integration of the new entered especially during the Roman Empire [5] as well as after the migratory waves starting with the IV century A.C. [8]. Alongside crops there is a huge history of including different other PGRFA such as fruit trees, shrubs as well as wild species for more than 7.000 years BC. The scope of our article is to investigate PGRFA such as vineyards, fruit trees and shrubs used today in Moșna, a remote traditional village in Sibiu county of Romania. We consider therefore that the study's results may fuel at the European Union level the need to increase our capacity to take into considerations for official surveys also the today neglected species in terms of official inventories. These neglected PGRFA and their specific use are generating the unicity of rural populations today in terms of culture residing

in small villages from the Easter to the Western counties as well as from the Mediterranean to the arctic areas.

MATERIALS AND METHODS

Study area. Traditional home-gardens belonging to 12 householders from Moșna commune, Sibiu county, Romania (46°5'32"N 24°23'44"E), with two villages Alma Vii (46°2'53.8"N 24°25'51.73"E) and Nemșa (46°5'9"N 24°26'43"E) were investigated.

Methods of investigations. A complete survey for households and officials regarding the current situation of vineyards, fruit trees and shrubs as well as the connectivity with the historical use of them was applied (Fig. 1).

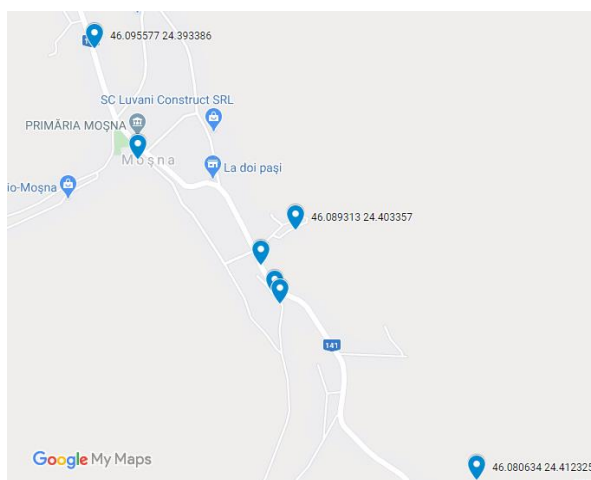


Fig. 5. The 12 locations generated for Moșna commune, Sibiu county, Romania by Antofie M.M. with the support of Google My Map on 14 August, 2020.

Source: https://www.google.com/maps/d/viewer?mid=1NWQtu_Rcsvj8On1Q_osCAAMWEQ7X0kbn&ll=46.088106006013795%2C24.40285550000003&z=15, Accessed on Sept 2020.

A unique questionnaire was applied for householders and officials from the City Hall [2]. The questionnaire includes among others a complete information related to householders, TK, the cultivation of vineyards, fruit trees and shrubs, collected during the 12 missions that took place between August and October 2019. This information will be used to further substantiate the official recognition at the local level, based on a bottom up approach, of traditional home-gardens as hot-spots of

biodiversity in Romania as well as in the European Union [1].

Official records The City Halls Officials supplied us all public data regarding the Forms A and B required on an annual basis by the National Institute for Statistics in agriculture chapter.

RESULTS AND DISCUSSIONS

Moşna as a commune, located into the Hârtibaciu Plateau in middle of Romania, a hilly area with specific climate characteristics, allowed during many centuries, the development of complex agricultural ecosystems: crops cultivation, vineyards, fruit trees and shrubs cultivation as well as animal breeding and beekeeping as well.

The commune was famous for trading agricultural products including wines and fruits on the agri-market of Mediaş (46°9'50"N 24°21'3"E), the main city of the region, located at 5 km distance, and for more than 300 years documentary attested [11].

The survey was conducted with the support of City Hall officials and covered for a single day and a single household all potential aspects of a comprehensive questionnaire [2]. The results of this survey, focused this time on vineyards, fruit trees and shrubs diversity and uses will be discussed below and grouped on the three subjects as well.

Vineyards. Once known as a famous area for the best wine in the region, this local community is cultivating nowadays vineyards only on 7 ha, that is 23 times less compared to 200 years ago when 170 ha were documented covered with vineyards [11]. Historical documents emphasized the economic importance of cultivating vineyards that took place on the top of the hills surrounding the village. The specific climate conditions of the area rested almost the same for centuries allowing the sun to ensure the best conditions for ripening the grapes only on the top of the hilly area. We need to mention that at the foot of the hills, especially during the ripening time due to seasonal conditions the fog stay for long time from the morning to the noon time creating the best conditions for pathogens development. However, by

cultivating vineyards on the top of the hills it is overcome this barrier. For many centuries the wine was considered of good quality for Moşna and mediocre for Nemşa. For both of them the wine was an important asset for the local economy of the 18th century.

A unique landscape was shaped, a village surrounded by medium height hills, terraced for vineyard cultivation, that remained unaltered during a long period of time up to the years 1970 (Fig. 2). After this period the vineyards were abandoned and the terrain was cultivated with crops and preserving the terrace shaping of the hills.



Fig. 6. Hilly terraced areas for the cultivation of vineyards in Moşna, Sibiu county, Romania. Household of no. 256.

Source: Original photo, taken on 18 August 2019, Antofie M.M.

From an economic point of view, we can have some interesting estimates for wine trade. Thus, back to 1750, the must urn of Moşna (2,704 l) cost 20 critters (100 critters = 1 florin or 0.4825 USD at the end of the 19th century), i.e. 0.1 USD (1 dollar in 1860 now costs 30.91 USD) or 3,091 USD in 2019, or about 2.61 Euros today (i.e. 13.20 lei today). Considering that the price today reaches 1.5 Euros pr litre (i.e. 6 lei), it can be considered that was much affordable for people today towards 3 centuries ago. Also, the must urn of

Nemşa (2,704 l) cost 15 pennies and the one of Alma (2,704 l) 12 pennies. Concluding we may have an idea of the functioning of the circular economy some two centuries ago. It is not enough to be! History teaches us that we need to redefine ourselves every time in the context of the manifestation of major social changes.



Fig. 7. Traditional home gardens include vineyards of old hybrids (photo above at no 417) and new varieties such as ‘Isabel’ (photo below at no 254).
 Source: Original photo, taken on 18 August 2019, Antofie MM.

Nowadays very popular are local vine hybrids with red grapes, that have been cultivated starting with the end of the 19th century after

the *Phylloxera* attack. Even this vineyard is not of high productivity and quality, it can be recorded in almost all home-gardens of Moşna and therefore it can be considered as part of their cultural heritage.

However, new varieties such as ‘Isabela’, are very popular in the vineyards of the commune together with ‘Black Pearl’ and ‘Riesling’. Usually, the old red hybrid is cultivated inside the home-gardens in the urban area (i.e. vineyards’ pergola) and the new varieties are cultivated on the top of the terraced hills (i.e. vineyards’ poles), outside urban areas (Fig. 3). The openness of householders towards integrating new and old varieties or hybrids is obvious.

Table 3. The fruit trees and shrub specie recorded in the gardens of householders of Moşna, Sibiu. Original data.

Crt. No.	Fruit’s trees species and bushes species	Varieties	
		Old	New
1	<i>Cornus mas</i> L.	x	
2	<i>Cydonia oblonga</i> Mill.	x	
3	<i>Juglans regia</i> L.	x	
4	<i>Malus domestica</i> (Suckow) Borkh.	x	x
5	<i>Prunus armeniaca</i> L.	x	
6	<i>Prunus avium</i> L.	x	
7	<i>Prunus cerasifera</i> Ehrh.	x	
8	<i>Prunus cerasus</i> L.	x	
9	<i>Prunus domestica</i> L.	x	x
10	<i>Prunus persica</i> (L.) Batsch,	x	
11	<i>Pyrus communis</i> L.	x	x
12	<i>Ribes uva-crispa</i> L.	x	
13	<i>Rubus fruticosus</i> L.	x	x
14	<i>Rubus idaeus</i> L.	x	x

Source: all data are based on original investigations by correlating the official data to the field data collected from home-gardens during 2020 in Moşna commune, Sibiu county, Romania.

Fruit trees. According to the current agricultural statistics based on indicators of Form A and B there are cultivated apple trees, pear trees, plum trees, apricots trees, cherries and bitter cherries, walnuts trees with a total production for 2018 of 60,220 t which means 362.77 t/ha. Inside the village we may found all species described in the Fiscal Transcription of Transylvania for more than

two centuries ago (Table no.1). With several exceptions they were found in archaeological human settlements of the region for more than 6,000 years ago [5]. The region can be considered as a habitat for plum tree, cherry, sour cherry trees and walnut tree, and adding other several species of fruit trees and shrubs based on the archaeological evidences mentioned before. Grafting and maintaining activities for orchards are continuously applied by all householders, being well integrated as a TK at the local community.

Pear trees are very popular too. They are not in great number and only old varieties can be found and some of them are very old (more than 80 years). Usually they are positioned in marginal areas of home-gardens due to their high vigour. Exists several newest home-gardens, without pear trees. 3,020 t of pear fruits have been harvested at the official level for the three communes of Moşna in 2018.



Fig. 8. Plum tree orchard, organized in large rows, inside the home-gardens at the household no. 418, Moşna, Sibiu county, Romania.

Source: Original photo, taken on 23 August 2019, Antofie MM.

Plum trees are a very common in all home-gardens. In certain traditional home-gardens they may occupy more than 500 m² as small orchards (the household of no. 418 in Moşna Fig 4). They are old varieties as well as some new varieties such as ‘Bistriţa’. At least two categories of varieties have been identified: early and late and related to the ripening season. Usually they are positioned as small orchards comprising several specimens in the

sunny areas of home-gardens. The highest production of the commune in 2018 was recorded for plums: 30,100 t. The use of fruits goes from the cuisine up to plum brandy of households use. The regeneration of plum trees is natural under the canopy of plum trees.

Apricot trees are common presence into all surveyed home-gardens. However, based on officials they are more numerous considering the production of 1,000 t declared for 2018. All recorded specimens belong to old varieties based on the owners’ declarations.



Fig. 9. Peaches, the variety ‘of vineyard’ and peaches seedlings in the second year inside the home-garden of 206 householders positioned outside urban area.

Source: Original photos, taken on 17 August 2019, Antofie MM.

Peach trees that have been recorded were all local varieties, named ‘de vie’ or ‘of vineyards’. They are very common and very much appreciated by the locals for taste, acidity, and texture. A production of 5,800 t

for 2018 was officially recorded at the commune level, but the productivity might be higher based on the discussions with officials. Moreover, locals are interested in starting their own seedlings production starting with local seeds for a three years life cycle before the final plantation in their home-gardens or orchards (Fig. 5).

Cherry and sour-cherry trees are also very common fruit trees in all home-gardens inside the urban area. They are not too many in terms of number of specimens, like in case of plum trees, but there are constantly present. The total production for 2018 was 5,400 t without the production not declared that may go for up to 8,000 t according to officials. We need to mention that both species have been found in archaeological settlements for more than 7,000 years ago [5]. Thus, it can be considered that this domesticated species is integrated for many centuries and it can be considered that it is living inside its own natural habitat.

Walnuts trees are also common species for Moşna and the region. However, they are occupying marginal areas in home-gardens inside urban area or in orchards. From cultural point of view, they occupy a central place in the mystic culture of community and therefore each of the traditional home-garden includes at least one vigorous walnut tree. Only 3,700 t of walnuts fruits have been declared as being harvested during 2018 at the commune level. However, the productivity can be tripled but it was not possible to be recorded when only solitary specimens were recorded in almost each home-garden and majority of them are older than 80 years.

Quince tree was recorded in 8 traditional home-gardens of 12 householders. They are of old origin not yet defined as a variety. These species are not recorded in the national inventory. They are part of the traditional culture of the village and have different culinary uses. The species was not recorded during the archaeological excavations and they are not recorded to reside inside all investigated home-gardens.

Raspberry is very common in home-gardens, and the place is famous for the presence of an old variety named ‘Saxon raspberry’ that is

similar to the new ‘Ostara’ variety in terms of continuous production during the summer time. However, the productivity is not so high but fruits are more perfumed compared to ‘Ostara’. The locals are also interested in new varieties and it was recorded the ‘Gold raspberry’ a yellow fruit variety very sweet and appreciated by the owner.



Fig. 10. Raspberry, the variety ‘Saxon raspberry’, red and highly perfumed is still cultivated for centuries in most of the house-gardens in the Moşna commune (upper image householder no. 418). However, householders are seeking to try the cultivation of new varieties such as the ‘Gold raspberry’(below photo householder no. 268).

Source: Original photos, taken on 17 August 2019, Antofie MM.

The cornelian cherry is not so often but still is present in certain home-gardens as old varieties. It is used in the cuisine and for medicinal purposes. The species is also in its own natural habitat as a wild species

considering the results of archaeological investigation that are dating the fossilized seeds for more than 7,000 years inside human settlements.



Fig. 11. Blackberries are also very popular cultivated bushes for Moșna commune in Sibiu county, Romania. In this image it is a thornless new variety (house no 268).

Source: Original photo, taken on 17 August 2019, Antofie MM.

Blackberries are not so popular into the commune. We need to mention that the wild species is next to the village in the wild and the thorns are a barrier towards the desire to cultivate this shrub. However, the householder from the no 268 was interested in cultivating the thornless cultivar of blackberry and declared that they are very satisfied with the quality of this variety.

European gooseberry is very common in all home-gardens as different old varieties. Usually they are towering the legumes areas being exposed to the sun. They also may be considered as traditional for their cultivation in these traditional home-gardens.

CONCLUSIONS

The landscape peculiarity of Moșna commune is highly contributing to the increased diversity of cultivated species inside their home-gardens either positioned in the urban area (the village area) either outside urban area (the arable land area).

Almost all described species are of archaeological importance too for the region

and they are contributing nowadays to the gastronomic value of the village for setting a specific fingerprint.

The openness of householders to integrate into the old diversity of cultivated species' and varieties other new varieties is a real fact.

For many centuries a specific traditional knowledge is constantly generated and developed in direct connectivity to agriculture.

It appears that no matters of political regimes this local community continued to be closely connected to the rich diversity of cultivated species that have been inherited from their ancestors for more than 7,000 years followed by the continuously testing and integration of new species and varieties. Grafting fruit trees and conducting apricot's nurseries in traditional way is also part of their traditional knowledge.

It can be considered that the gastronomic fingerprint of Moșna locality is still dominated by vineyards, several fruit trees and domestic shrubs species as well.

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