



Traditional plum brandy in Transylvania

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Abstract. This article aims to shortly review what traditional plum brandy means for Transylvanian people and what are the characteristics of plum brandy produced in Transylvania. In Romania, traditional plum brandy is a resource that does not generate much profit. However, homemade brandy is a common product of subsistence farming, most often intended for own consumption or used as a gift. Traditional natural brandy has therapeutic values if consumed in moderation, and consumption in moderation at special times creates a pleasant atmosphere. The consumption of brandy in Transylvania is closely linked to traditions and especially to the slaughter of the Christmas pig.

Key Words: traditional brandy, plum brandy, Transylvania, Romania, homemade brandy.

Introduction. The history of alcohol begins around 7000 BC in China, with a rice-based alcohol (Liu et al 2019; Shridevi & Ponni 2020). However, remnants of alcoholic beverages (mead) were found to date much earlier. Scientists found 9000-year-old pottery jars in the Neolithic village of Jiahu, in Henan province, Northern China (Vidrih & Hribar 2016). The next records of obtaining alcohol appear around the year 5000 BC, in the Egyptians, who used it in substances intended for mummification processes, as well as in obtaining perfumes, cosmetics and beverages (Vidrih & Hribar 2016). Subsequently, a diversification of wines, beer and brandy began.

Brandy (Romanian: Rachiu. Greek and Turkish: Rakı) is the name given to the various alcoholic beverages obtained by distilling juices from the fermentation of fruit or cereals. Because it is produced by distillation, brandy has a higher alcohol content than wines. The brandy, according to the geographical region we are referring to, also has other names, such as: pălincă (for example, in Sălaj), horincă (in Maramureș and Țara Oașului; sometimes horilcă) or țuică (which is the most common term). In Transylvania, the most famous traditional brandy is the one obtained from plums, which has an unmistakable smell and taste.

Plum production in Romania is very high. According to FAOSTAT (www.fao.org) Romania is always in the top 10 largest plum producers in the world. This tradition for homemade brandy has as its premise an abundance in the production of plums from ancient times (Beceanu 2007).

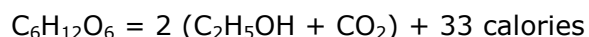
Brandy, along with other types of alcohol, has been considered in the literature a cause of health problems (Pose et al 2021; Åberg et al 2020; Hosseini et al 2019) and a source of social problems (Shridevi & Ponni 2020). At the same time, the therapeutic role of good quality brandy, consumed in moderation, is indisputable (Chiva-Blanch & Badimon 2020). The traditional brandy has a special role in the work carried out in winter by the Transylvanian farmer. A glass of brandy is often drunk before slaughtering the pig for Christmas (Muntean et al 2010). Farmers say a glass of brandy warms you up before work in the cold. Science has shown that this statement is not a myth, but alcohol is actually a peripheral vasodilator (Vale 2007) and provides instant energy through the ketones it generates rapidly in the bloodstream (Zakhari 2006).

This article aims to shortly review what traditional plum brandy means for Transylvanians and what are the characteristics of plum brandy produced in Transylvania.

Secrets of traditional Transylvanian plum brandy. In order to produce a good quality traditional Transylvanian brandy, you have to take care of the plum trees with a lot of dedication, and in the autumn the fruits are harvested patiently, one by one. It is ideal to harvest only the fruit that has fallen on the ground, because plums shaken with a stick can be unripe and the yield at distillation will not be good. Some farmers resort to shaking plums, but only if they are ripe enough. The more ripe and sweeter the plums, the more concentrated and high-quality the brandy will be. The plums are fermented in huge wooden pots or large plastic barrels and left there for at least two months (www.fabricadetuica.ro).

The fermentation of the fruit in the barrels is caused by the yeasts (Phaff et al 2013; Hou et al 2022). Yeasts are present in nature everywhere: in the soil, in water, on plants, on fruits and animals (Kurtzman et al 2011; Hou et al 2022). Sweet fruit juice is an ideal environment for these microorganisms (Phaff et al 2013). After harvesting, the plums are passed into the fermentation containers and with them the yeasts. When conditions become favorable, the yeasts begin fermentation (www.fabricadetuica.ro).

Fermentation is a process closely linked to the metabolism of yeasts (Erian & Sauer 2021). Carbohydrates in fruit juice enter the yeast cells by diffusion or osmosis, where, under the influence of enzymes, they are metabolized and transformed into substances of the same kind as the protoplasm. The transformation of nutrients inside the yeast cells is done only by consuming energy from outside. In the case of alcoholic fermentation, the energy required for yeasts is obtained from the incomplete transformation of carbohydrates (mainly into alcohol) in the absence of oxygen (Marcus et al 2021). From a biological point of view, fermentation is an energetic process, which replaces respiration in airless environments, with the elimination of a small amount of energy (33 calories) (www.fabricadetuica.ro). Therefore, the yeasts, in order to ensure their vital functions, metabolize larger amounts of carbohydrates than they need for their nutrition. This corresponds to practical needs, because the main product resulting from this transformation is alcohol, which accumulates in the liquid. Usually, the pattern of alcoholic fermentation is given by the following equation:



The duration of fermentation of plums is influenced by the type of barrels and their size. In 150-200 L containers, at temperatures of 14-23°C, the duration is 8-10 days, and at higher temperatures, the fermentation can end even after 6 days (www.fabricadetuica.ro). The end of fermentation can be determined organoleptically or by laboratory analysis. Plums that have finished fermenting are immediately distilled, otherwise there is a significant loss of alcohol by aeration. The timing of distillation influences the yield and quality of the distillate obtained. The faster the distillation is finished after fermentation, the better the quality of the brandy and the yield.

The fermented fruit is ready to put in the boiler when it comes off the edges of the barrel and forms like a hat over the fermented material. When fermented, the mixture is mixed well, taken with a bucket and placed in the boiler. High heat is turned on and the copper boiler kept with the lid open, stirring gradually (www.fabricadetuica.ro). When the boiler becomes warm, boiler lid is put on and the pipes are installed. Through the pipes the brandy vapors will circulate before condensation. The cooler in which the water must be cold is prepared. The boiling and distilling plant must be very well sealed, otherwise all the strength of the brandy will be lost by evaporation and the work will be wasted (www.fabricadetuica.ro).

From the moment the boiler lid is put on, the fire is allowed to slow down (making sure that the thermometer that is mounted on the boiler does not exceed 80-85°C), because there is a risk that the boiled material will reach the pipes or the product will flow too quickly and compromises production at that boiler. On the principle of the communicating vessels, in 10-15 minutes, the steam of the brandy, once it reaches the

area of the cooler, condenses and the brandy starts to flow on coolers' pipe (www.fabricadetuica.ro).



Figure 1. Aspects of the production of traditional Transylvanian brandy (photo from own archive).

To avoid smoking the brandy and sticking the fruit to the bottom of the boiler, the boilers are equipped with a mechanical stirrer so that the worker mixes the material during boiling (www.fabricadetuica.ro).

In the case of brandy produced from natural sources, distillation can be seen as a technological operation to extract ethanol and other volatile components from alcoholic materials fermented using distillation plants. Natural brandy products are drinks resulting from the distillation of plums or other fruits that have undergone an alcoholic fermentation process (www.fabricadetuica.ro).

In the case of fermented materials for the manufacture of brandy, in addition to water and ethanol, they also contain significant amounts of aldehydes, esters, volatile acids (Gantumur et al 2022), which passing into the distilled solution could give it an unpleasant taste and smell. In order to obtain a pure brandy rich in ethanol, it is necessary to separate certain fractions of distilled liquid from the mixture during condensation.

The rectification operation is applied to remove impurities. Therefore, the rectification is a fractional distillation, respectively a repeated distillation several times in order to remove impurities from the mass of the distilled solution (López 2021). The alcohol obtained by redistillation is called rectified alcohol (López 2021). Transylvanian plum brandy is generally a brandy obtained by distillation and redistillation (double distillation).

Fresh brandy, depending on the type of fermented material, can be whitish or, most often, transparent. When it is cloudy, for clarification and for keeping it in the best condition, it is kept in cellars, in tightly closed mulberry barrels. In mulberry barrels, the brandy turns yellow (Nikićević 2021). The older the brandy, the better the quality and the more concentrated it becomes (Nikićević 2021), because the more the barrel absorbs from the water over time.

Freshly produced plum brandy from Transylvania has an alcoholic strength of 48-52 degrees (Table 1). In the south of the country, brandy distillation is done only once, resulting in a drink with a lower alcohol content.

Rusu (2011) determined the concentration of major phenolic compounds in plum brandy, namely: gallic acid and chlorogenic acid. The researcher also determined the content in kaempherol (3,4',5,7-tetrahydroxyflavone), which is specific to plum brandy (Rusu 2011). These studies show the phenolic markers specific to the raw material from which the distillates were obtained (Table 2).

Table 1

The values obtained for alcohol concentration and relative density in Tansylvanian plum brandy samples (P1-P18) (Rusu 2011)

<i>Sample (P - plum brandy)</i>	<i>Location</i>	<i>Relative density g cm⁻³</i>	<i>Alcohol concentration, % Vol</i>
P1	Tioltiur	0.93330	48.37
P2	Petrești	0.92916	50.50
P3	Beclean	0.93342	48.31
P4	Ciucea	0.93395	48.03
P5	Seini	0.92551	52.32
P6	Morlaca	0.93061	49.76
P7	Săliște de Sus	0.93142	49.34
P8	Vișeu de Sus	0.92406	53.03
P9	Vișeu de Jos	0.93162	49.24
P10	Moisei	0.92089	54.56
P11	Leordina	0.92626	51.95
P12	Năsăud	0.92514	52.50
P13	Rebrișoara	0.91506	57.29
P14	Salva	0.91902	55.45
P15	Runc	0.93815	45.77
P16	Feldru	0.92160	54.22
P17	Bârlea	0.92859	50.80
P18	Negreni	0.92956	50.29
Mean values		0.93±0.01	51.21±2.96

Table 2

Amounts of phenolic compounds identified in samples (mg L⁻¹) (Rusu 2011)

<i>Type of phenolic compound</i>	<i>Amounts of phenolic compounds identified in three samples of plum brandy (mg L⁻¹)</i>		
Gallic acid	26.6	86.6	175.3
Protocatecuic acid	-	-	-
Chlorogenic acid	1.1	10.3	7.6
Quercetin	-	-	-
Kaempherol	1.1	2.8	0.9

Sale of traditional Transylvanian plum brandy. Unfortunately, the vast majority of citizens who produce their own brandy uses it for their own consumption, or gives it as a gift to people they know on the occasion of special events. The sale of brandy under legal conditions involves very high additional costs, mainly represented by excise duties. The production costs of Transylvanian brandy (with an alcohol concentration of 50 degrees) are about 4 euros per liter, the selling price without drawing up the legal forms would be about 6 euros, the excises are still about 6 euros (so the price would go up to 6 + 6 = 12 euros). In addition to the 12 euros, it would be necessary to add expenses for transport, human resources, space, or intermediation of the sale. In the end, the price could go up to 20 euros per liter.

Most citizens of Transylvania have this product either as their own production or have the product from a close relative of the family. For this reason, marketing inside the country of traditional brandy through shop networks is very unprofitable and very unlikely. The most common way to legally sell traditional Transylvanian plum brandy is to

export to countries with low raw material resources, low production and high per capita consumption.

Conclusions. Freshly produced plum brandy from Transylvania has an alcoholic strength of 48-52 degrees. In the south of Romania, brandy distillation is done only once, resulting in a drink with a lower alcohol content. Plum brandy contains major phenolic compounds such as gallic acid and chlorogenic acid, but also kaempferol (3,4',5,7-tetrahydroxyflavone), which is specific to plum brandy. These phenolic compounds serve as markers specific to the raw material from which the distillates were obtained.

In Transylvania, traditional plum brandy is a resource that does not generate much profit. However, homemade brandy is a common product of subsistence farming, most often intended for own consumption or used as a gift. Traditional natural brandy has therapeutic values if consumed in moderation, and consumption in moderation at special times creates a pleasant atmosphere. The consumption of brandy in Transylvania is closely linked to traditions and especially to the slaughter of the Christmas pig.

Conflict of interest. The author declares no conflict of interest.

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