

USE OF PRIMARY AMPELOGRAPHIC DESCRIPTORS IN ESTABLISHING THE SIMILARITY-DIFFERENCE DEGREE BETWEEN VINE VARIETIES WITH DIFFERENT ORIGINS

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Abstract

Vine varieties, no matter which their production direction may be, are characterized by an emphasized morphologic variability, given by their genetics, but also by the fact that these are influenced in a higher or lower degree by climatic and agro-technical factors, thus manifesting differently, according to the crop area. Within this study, it was aimed to morphologically express the 'Pinot noir', 'Pinot blanc', 'Pinot gris', 'Chardonnay', 'Traminer rosé' varieties under the conditions of the experimental field of U.A.S.V.M. Bucharest. The studied varieties show a common lineage and they all show their stressed character of morphological variability. For the ampelographic description, there have been used 37 ampelographic descriptors according to the International Organisation of Vine and Wine (OIV) descriptors as modified by EU project Genres CT96 No81. The achieved results highlight different degrees of similarity of these varieties with the 'Pinot noir' variety, taken as standard, and the variety with the lowest degree of similarity is 'Chardonnay' - with a percentage of only 45.94% compared to the standard.

Key words: ampelographic descriptors, biodiversity, dissimilarity, morphological, similarity

INTRODUCTION

Approaching such a theme and that is, establishing the degree of similarity, dissimilarity respectively, between five varieties of grape using as reference variety the variety 'Pinot noir', it can appear as an approach of which end is greatly known. For sure, studies carried out so far (Bowers et al., 1999; Regner et al., 2000; Christensen et al., 2003; Bettiga, 2003; Stroe, 2012) established, over the course of time, which is the degree of similarity between several varieties of grape.

As a matter of fact, this has been a perpetual preoccupation of the scientific research, to find out the way in which the grape varieties appeared, the way in which they evolved and their degree of kinship.

Despite all this, grape in general can develop differently, depending upon the crop area, both from the phenotype and agrobiologic and technological perspective.

Practically, within this study there was evaluated the morphologic expression of varieties and the extent to which it is influenced

by the crop area, within a comparative system, using as control the 'Pinot noir'.

In recent years, as result of advanced research, both in terms of establishing the genetic origin of varieties and their degree of relatedness, scheme description used to describe and identify varieties of grape-vines, was confined to a small number of characters analyzed, 147 of the total descriptors, restricted scheme comprises of 37 descriptors that highlight and demonstrate in the highest degree the similarities and differences between them.

This has been agreed upon within an agreement with O.I.V., amended by EU, by Genres CT96 No81 Program (Damian et al., 2011; Bergamini et al., 2012).

MATERIAL AND METHODS

Plant material

The research developed in the winegrowing year 2011-2012, in the experimental field of U.A.S.V.M. Bucharest.

The varieties which form the object of these researches are: 'Pinot noir', 'Pinot blanc', 'Pinot gris', 'Chardonnay', 'Traminer rosé', varieties

which are very appreciated by consumers with regard to wines quality and specificity which are obtained from these.

The selected type of pruning was Guyot on semi-stem, the planting distance of 2.0/1.2 m, with a load of 30 buds/vine.

Ampelographic characterization

It was performed comparing morphology in two consecutive years (2011-2012) by means of primary and secondary descriptors, as indicated in the frame of the 2nd edition of the OIV Descriptor List for grape varieties and *Vitis* species.

(http://www.oiv.int/oiv/files/5%20-%20Publications/5%20-%201%20Publications%20OIV/EN/5-1-9_Liste_descripteurs_2ed_EN.pdf).

37 characters were selected:

6 characters for the description of the shoot - 001, 003, 004, 007, 008, 016;

2 for the young leaf - 051, 053;

17 for the adult leaf - 065, 067, 068, 070, 072, 073, 074, 075, 076, 078, 079, 080, 081-1, 081-2, 083-2, 084, 087;

5 for the bunch - 202, 203, 204, 206, 208

6 for the berry - 223, 225, 228, 231, 235, 236;

1 berry: formation of seeds- 241.

RESULTS AND DISCUSSIONS

Ampelographic characterisation of each variety was performed using 37 markers; as a reference (Table 1, Table 2) are reported data related to varieties that first reached fruit production.

As result of interpretation of data in which there can be found the synthesised scheme of the most representative ampelographic descriptors (37), specific for all the organs of the vine, this being the reduced variant of establishing the degree of similarity – dissimilarity between the varieties submitted to study, the following have resulted:

The variety with the highest degree of similarity is the 'Pinot blanc' (Figure 2) which has a number of 28 ampelographic characters common to the 'Pinot noir', (Figure1) having a degree of 75.67% similarity to it, as follows: in the case of the young shoot of the three studied



Figure 1. 'Pinot noir' variety

characters, (001 -opening of the shoot tip, 003 - intensity of anthocyanin coloration on prostrate hairs of the shoot tip, 004 - density of prostrate hairs on the shoot tip) 'Pinot blanc' is similar for two of these, that is 001 and 004.

In the case of the young leaf, the similarity is at the colour of upper side of blade (4th leaf) - 051, and in the case of adult shoot of the two studied characters the similarity is complete, that is at the colour of the dorsal side of internodes and colour of the ventral side of internodes (007, 008).



Figure 2. 'Pinot blanc' variety

When we talk about the adult leaf, the most representative body of ampelographic recognition, the degree of similarity is very high, respectively of the 17 studied characters; 'Pinot blanc' is similar for a number of 14 characters, which is in a proportion of 83%.

The similarity can be found in the case of size of blade descriptors (065), goffering of blade (072), and area of anthocyanin coloration of main veins on upper side of blade end profile of blade in cross section (074).

Also, shape of teeth (076), as well as degree of opening – overlapping of petiole sinus (079) and shape of base of petiole sinus (080) are similar.

At the grape-cluster, the similarity is a four of the five studied characteristics, respectively length (peduncle excluded) – (202), width (203) and their density (204), as well as length of peduncle of primary bunch (206).

The berry is similar in the case of four characters out of six, which is shape (223), intensity of flesh anthocyanin coloration (231) firmness of flesh (235) and particular flavour (236).

The seeds are present and fully developed (formation of seeds 241) this being valid for all the studied varieties.

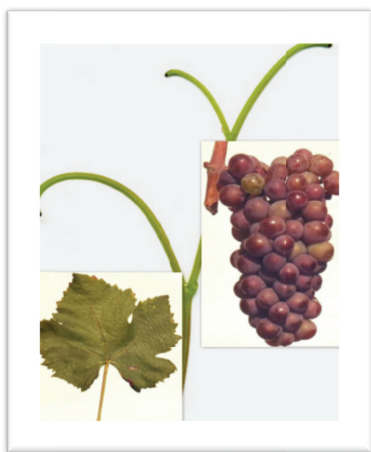


Figure 3. 'Pinot gris' variety

The following variety as degree of similarity is the 'Pinot gris' (Figure 3) which with a number of 23 characters shows a degree of 62.16% similarity, as compared to the control variety, which in the case of the young shoot is similar for (001 – opening of the shoot tip end 004 – density of prostrate hairs on the shoot tip).

In the case of the adult leaf, 'Pinot gris', it is similar in the case of ten characters that is to shape of blade (067), profile of blade in cross section (074) shape of teeth (076), length of teeth compared with their width (078).

Degree of opening – overlapping of petiole sinus (079) as well as of shape of base of petiole sinus (080) and teeth in the upper lateral sinuses 083-2 end density of prostrate hairs between main veins on in the upper lateral sinuses 083-2 end density of prostrate hairs between main veins on lower side of blade (084) is similar.

At the grape cluster, the similarity is for three out of five characters, length (peduncle excluded) – (202), width (203) and their density (204).

In the case of the berries the similarity is higher than in the case of the 'Pinot blanc', the latter being similar for five out of the six characters. Thus, the shape of the berry, the skin thickness, the pulp colouring intensity, the degree of consistence of the pulp and the taste are similar, only the skin colour descriptor being different (225).



Figure 4. 'Traminer rosé' variety

The third is the 'Traminer rosé' (Figure 4), which with a number of 19 characters, showing a degree of 51.35% similarity, as compared to the control variety.

In the case of this variety, the similarity can be found at the young leaf, the adult shoot with only one character, and at the adult leaf there are seven similar characters, among which: shape of blade (067), area of anthocyanin coloration of main veins on upper side of blade (070), degree of opening – overlapping of petiole sinus (079) end shape of base of petiole sinus (080) and teeth in the upper lateral sinuses 083-2.

The grape cluster of the 'Traminer rosé' variety is similar to that of 'Pinot noir', for three out of five characters, 202, 203, 204 (length peduncle

excluded, width and density). For the berry, the number of characters defining the degree of similarity is three, these being shape - 223, intensity of flesh anthocyanin coloration - 231 and particular flavour - 236.

The highest degree of dissimilarity is represented by the 'Chardonnay' (Figure 5), by the 17 characters, leading us to a percentage of 45.94%, similarity as compared to the control. This is similar to the control for the young shoot, and in the case of the adult leaf, the number of similar characters is only eight. These are represented by undulation of blade between main or lateral veins (073), goffering of blade 072, profile of blade in cross section 074, shape of teeth end length of teeth compared with their width (076, 078).

Shape of base of petiole sinus (080) and teeth in the upper lateral sinuses (083-2) are identical.

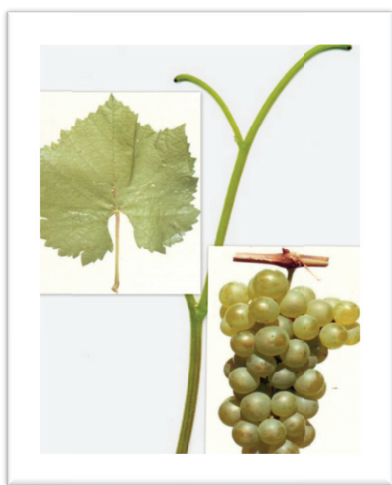


Figure 5. 'Chardonnay' variety

The grape cluster is similar in the case of width, compactness and shape.

The berry of the 'Chardonnay' grape cluster is identical to that of 'Pinot noir' regarding shape, colouring intensity of the pulp, the skin thickness and taste, the difference appearing at the code 225 (skin colour) and 235 (degree of consistence of the pulp).

CONCLUSIONS

The data obtained in the case of using the reduced scheme which contains only 37 ampelographic descriptors, out of the total of 147, the order regarding the degree of similarity – dissimilarity between the studied varieties is the following: the 'Pinot blanc' is the closest to the control variety with a percentage of 75.67% similarity.

The 'Pinot gris' is ranked the second with a degree of 62.16% similarity, as compared to the same variety taken as control.

The third in order of similarity is the 'Traminer rosé' with a percentage of 51.35% similarity, the last being the 'Chardonnay' variety, with a degree of similarity of 45.94% as compared to the control variety.

The results can provide us with a series of information with regard to the varieties origin, their degree of kinship, the way in which they develop within a specific area and at the same time, they demonstrate the necessity of closely knowing the grape varieties in general and their behaviour and development in a specific area, in particular.

This order is an order which appears almost natural, and which has its origin in the theory that there are numerous families and group sorts of varieties, very similar to one another and that approximately 75% of these are related, which indicates to us the fact that, genetics – by genome scanning, shall settle the potential uncertainties with regard to the origin and degree of kinship in the case of grape varieties.

Table 1. 18 ampelographic primary descriptors are reported in highlighted columns

Varieties	001	003	004	007	008	016	051	053	065	067	068	070	072	073	074	075	076	078
Cod OIV																		
Pinot noir (control)	7	1	5	2	1	1	1	7	5	3	3	2	5	1	4	3	2	5
Traminer rosé	7	5	7	3	1	1	3	7	3	3	1/2	2	7	0	4	5	3	3
Pinot gris	7	3	5	1	3	1	1	5	3	3	2/3	0/1	7	0	4	5	2	5
Chardonnay	7	5	5	3	3	1	3	1	3	4	1/2	0/1	5	1	5	3	2	5
Pinot blanc	7	7	5	2	1	1	1	5	5	4	2/3	2/3	5	1	4	3	2	5

Table 2. 19 ampelographic primary descriptors are reported in highlighted columns

Varieties	079	080	081/1	081/2	083/2	084	087	202	203	204	206	208	223	225	228	231	235	236	241
Cod OIV																			
Pinot noir (control)	3	1	1	1	1	5	3	3	3	7	5	3	2	9	3	1	1	1	3
Traminer rosé	3	1	0	1	1	5	5	3	3	7	3	2	2	5	5	1	3	1	3
Pinot gris	3	1	1	1	1	5	0	3	3	7	3	2	2	4	3	1	1	1	3
Chardonnay	2	2	0	3	1	1	5	3/5	3	7	3	3	2	2	3	1	3	1	3
Pinot blanc	3	1	0	1	1	5	3	3	3	7	5	2	2	2	5	1	1	1	3

	dissimilarity
	similarity

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