An AFLP-marker study of the *Vitis vinifera* cultivar White Riesling comprising 86 clones to investigate the stability of clones

Anhalt UCM[1], Crespo Martínez S[1], Rühl E[2], Forneck A[1]

[1] University of Natural Resources and Applied Life Sciences, Department of Applied Plant Sciences and Plant Biotechnology, Institute of Horticulture, Fruit-Growing, and Viticulture, Peter Jordan Str. 82, 1190 Vienna, Austria
[2] Geisenheim Research Centre, Section for Grapevine Breeding and Grafting, von-Lade-Strasse 1, 65366 Geisenheim, Germany

Universität für Bodenkultur Wien
Department für Angewandte Pflanzenwissenschaften und Pflanzenbiotechnologie

Introduction

Horticultural clones are asexually derived from a single individual and clonal variation can only occur through mutations.
The aim of this study was to assess AFLP markers for classifying mutations in 86 Riesling clones and to enhance our understanding their dynamic and stability reflected by AFLP fingerprints (Fig. 1).

Materials and Methods

AFLP procedure was performed following the protocol by Vos *et al*. (1995) with the restriction enzymes *Eco*RI and *Mse*I (*Tru*1I).
For the visualization of the bands a LI-COR NEN 4300 DNA analyzer was used (Licor Biosciences GmbH, Bad Homburg, Germany).

Table 1 Polymorphism and mutations of Riesling clones compared to the amplified fragments length polymorphism primer combinations used. 5% or less clones mutated: random mutations; more than 5% of clones mutated: specific loci mutations (Table: Anhalt *et al*. 2010).

Marker name	Marker bands			Total amount of bands with mutations in:		
	Total	Poly-morphic	Mono-morphic	One single clone	< than 5% of all clones	> than 5% of all clones
E-AAG-M-ATT	26	14	12	5	5	4
E-AAG-M-CAA	29	15	14	3	10	2
E-AAG-M-CAC	44	7	37	5	2	-
E-ACA-M-ATT	41	20	21	8	10	2
E-ACA-M-ATC	37	23	14	8	12	3
E-ACA-M-CAC	21	7	14	2	4	1
E-AGG-M-ATC	35	8	27	5	3	-
E-ACT-M-ATT	25	12	13	4	3	5
E-ACT-M-ATC	28	19	9	8	8	3
E-ACT-M-CAC	19	10	9	4	3	3
Total	305	135	170	52	60	23

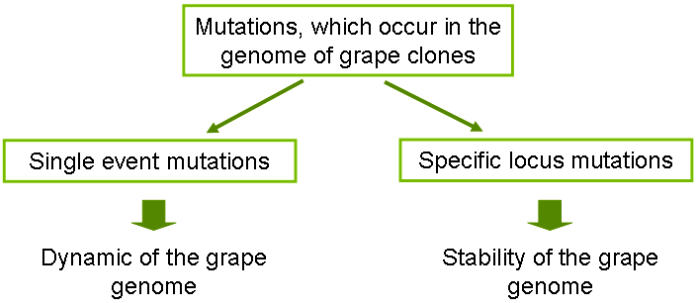

Fig. 1 Mutations detected in the grape genome of the present study. Single event mutations (occurred only once or in < 5% of all clones) stand for the dynamic of the grape genome and specific locus mutations (occurred frequently, > 5%) stand for the stability of the grape genome.

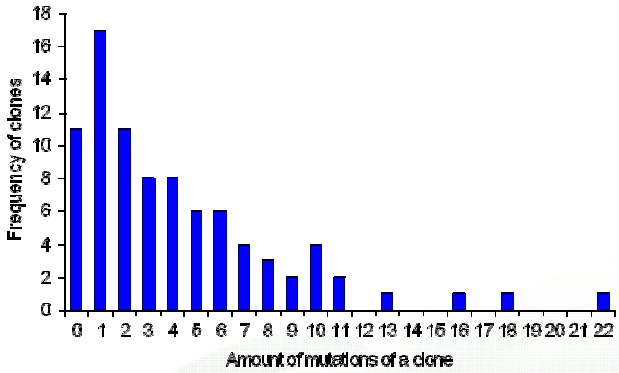

Fig. 2 Figure shows the amount and frequency of mutations between the 86 Riesling clones. The highest amount of mutations were single event mutations occurring only once in one Riesling clone. (Figure: Anhalt *et al*. 2010).

Results and Discussion

AFLP markers detected 135 polymorphic bands of a total amount of 305 bands and were able to show clonal differences and distinct types of mutations (Table 1; Fig. 2). 36,7% single event mutations (only detected in one clone or in < 5% of all clones) and 7,5% specific loci mutations (found frequently in the set of clones) occurred in the present study. This indicates that the grape genome is not stable rather shows its dynamic.

Conclusion

Since it is important to preserve the genetic variability of a cultivar and at the same time the genetic stability of clones the knowledge of clonal stability is essential.
Direct measurements of mutations in vegetatively propagated lineages should therefore give an indication how to deal with dynamic clones in practice.

References

Anhalt UCM, Crespo Martínez S, Rühl E, Forneck A (2010) The stability of clones - An AFLP-marker study of the *Vitis vinifera* cultivar Riesling comprising 86 clones. *Accepted*

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