

References

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Serological detection of closterovirus-like particles associated with grapevine leafroll disease - an improvement in clonal selection

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Abstract: Leafroll disease is one of the most widespread and damaging virus diseases of the grapevine. Up to now the diagnosis for sanitary selection was carried out by grafting an indicator cultivar (e.g. Blauer Spätburgunder) onto the scion to be tested. Very recently, closteroviruses have been detected in leafroll diseased grapevines. In all the cases, closteroviruses were associated with leafroll affected plants. In the meantime, antisera produced against two types of closterovirus associated with grapevine leafroll disease (GLRaV Type 1, Type 3) have become available.

The viral antigens could be detected serologically by ELISA in both diseased and symptom-free leaves, in dormant buds and in phloem extracts of infected plants.

A survey of leafroll disease was carried out in the viticultural regions of Baden-Württemberg. Samples based on visual observations made in commercial vineyards and in an indexing field were tested by ELISA using antisera against GLRaV₁ and GLRaV₃. GLRaV₁ could be detected by ELISA in all the plants from the commercial vineyards showing leafroll. GLRaV₃ only occurred in a few samples. Several samples were investigated by means of immunosorbent-electronmicroscopy (ISEM). In all the extracts from affected plants, closterovirus-like particles decorated with the specific antibodies could be detected. No decorated particles were found in extracts from healthy grapevines. All the plants from the indexing field showing symptoms over 3 years were infected with GLRaV₁ according to the ELISA test. Symptom-free indicator plants never showed a positive reaction either with GLRaV₁ or GLRaV₃.

It was thus possible to confirm the association between leafroll symptoms and serologically detectable closteroviruses. ELISA appears to represent a good tool for the diagnosis of grapevine leafroll disease and an improvement for the sanitary selection of clones.