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9-16 Transmission of *Cherry leaf roll virus* (CLRV) variants from German and Finnish birches by grafting

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INTRODUCTION

Cherry leaf roll virus (CLRV) is a worldwide distributed *Nepovirus* within the family *Secoviridae* affecting primarily decidious trees and shrubs (Büttner *et al*. 2011). The broad host range includes major forest tree species including silver birch (*Betula pendula*) and downy birch which are the most important broadleaved tree species in Northern and Eastern Europe (Hynynen *et al*. 2010). In northern Scandinavia and Finland the "birch leaf-roll disease" has emerged in the region since its first appearance ten years ago. The disease could be associated with a CLRV infection (Jalkanen *et al*. 2007). Investigations regarding genetic diversity demonstrated that CLRV variants from Finnish birches show atypical phylogenetic relations (von Bargen *et al*. 2009). Therefore, grafting trials were carried out to compare biological characteristics of CLRV variants from Finnish birches with virus variants occurring in *Betula* species in Germany.

MATERIAL AND METHODS

In spring of 2011 scions were obtained from different CLRV-infected downy birches (5 trees, Rovaniemi, Finland) and silver birches (5 trees, Berlin, Germany) and were grafted by triangulation onto 2-year old seedlings (*B. pubescens* and *B. pendula*). The 200 grafted scions (n = 20) were cultivated under identical conditions and were regularly inspected for symptoms associated with a CLRV-infection during the vegetation periods of 2011 and 2012. In parallel, leaf material was collected for CLRV detection by serological and molecular methods. Sampled *B. pendula* scions of German origin were tested by CLRV-

specific IC-RT-PCR (Werner *et al.* 1997) and DAS-ELISA. Total RNA was extracted from *B. pubescens* rootstocks grafted with CLRV-infected scions of Finnish origin and subjected to RT-PCR applying three different primer sets targeting the replicase-coding region, the coat protein-coding region, and the 3´ untranslated region of CLRV.

RESULTS AND DISCUSSION

Seventy of 100 grafted CLRV-infected silver birch scions, obtained from German stands survived and grew vigourously in 2011 and 2012, whereas CLRV-infected scions originating from Finnish *B. pubescens* only survived for five months suggesting an effect caused by the atypical Finnish CLRV variants. However, graft transmission of CLRV variants affecting Finnish trees succeeded, because *B. pubescens* seedlings developed symptoms such as leaf roll, veinbanding, chlorotic ringspots, proliferation and CLRV was detected in 7 out of 20 investigated survived rootstocks. In June 2012 twenty out of 70 *B. pendula* scions showed virus-like symptoms and the virus could be detected in 24 silver birches including asymptomatic seedlings. Further investigations are necessary to determine biological and genetical traits of the CLRV variants present in grafted trees.

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