

A novel virus is associated with the ringspot disease in Common oak (*Quercus robur*)

SUSANNE VON BARGEN¹, MARIUS REHANEK¹, HANS-PETER MÜHLBACH²,
ARTEMIS RUMBOU¹, THIERRY CANDRESSE³, MICHAEL KUBE⁴, MARTINA
BANDTE¹ and CARMEN BÜTTNER¹

¹ Humboldt-Universität zu Berlin, Division Phytomedicine, Lentzeallee 55/57, 14195
Berlin, Germany, susanne.von.bargen@agrar.hu-berlin.de

² University of Hamburg, Biocenter Klein Flottbek, Ohnhorststraße 18, 22609
Hamburg, Germany, hpmuehlbach@gmx.net

³ UMR 1332 BFP, INRA, Univ Bordeaux, 33882 Villenave d'Ornon, France,
thierry.candresse@inra.fr

⁴ Thünen Institute, Institute of Forest Genetics, Eberswalder Chaussee 3a
15377 Waldsiedersdorf, Germany, michael.kube@thuenen.de

Keywords: *Emaravirus*, RT-PCR, chlorotic ringspots

ABSTRACT

A novel putative *Emaravirus* was identified by high-throughput sequencing in a sample obtained from diseased Common oak (*Quercus robur* L.) from a seed production stand in Fellinghausen, Germany. Like other Emaraviruses it is composed of four monocistronic genome segments. Each of this core of genome segments encode a single open reading frame in negative orientation; RNA1 consists the replicase, RNA2 a glycoprotein precursor, RNA3 the viral nucleocapsid protein, and RNA4 the putative movement protein of approx. 42 kDa. Some members of the genus contain up to four additional genomic RNAs encoding additional proteins of unknown function. The affected oak tree expressed chlorotic ringspots and mottling of leaves since several years. The association of the discovered novel *Emaravirus* with observed symptoms was studied by RT-PCRs targeting the viral RNA1, RNA3 and RNA4, respectively. Leaves from oak trees were sampled from sites in different European countries including a seed collection stand and park, road side or forest trees. Virus detection was closely correlated with Common oaks exhibiting characteristic chlorotic ringspot symptoms while it was neither detectable in leaf material collected from trees without virus-like symptoms nor other *Quercus* spp. showing regular chlorotic patterns or partial chloroses of leaves. Results further confirmed that the virus also affects the *Q. robur* cv. "Fastigiata Koster" (Cypress oak) which is a very popular decorative ornamental tree due to its upright branches leading to the columnar shape of the canopy.