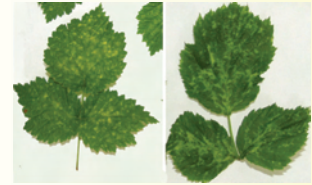


Identifying viruses in raspberry

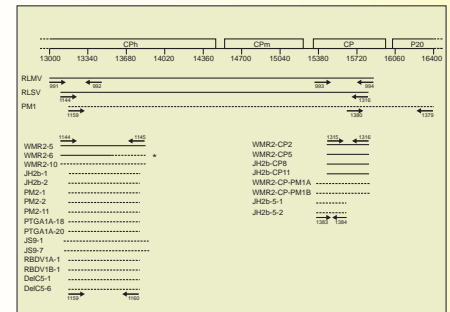
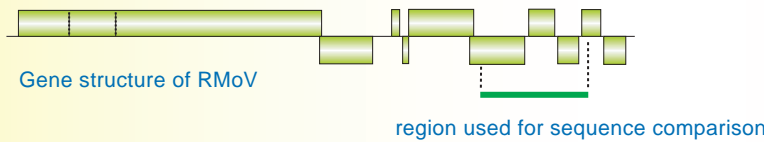


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It is very common to see raspberry plants in the field with obvious symptoms of chlorotic (yellow) leaf spots and mosaics. These symptoms have been attributed to a number of viruses, including Raspberry leaf spot virus (RLSV) and Raspberry leaf mottle virus (RLMV). Very recently a new virus, Raspberry mottle virus (RMoV) with similarities to RLSV and RLMV was identified in the USA. We have analysed virus-infected plants sampled from around Tayside, and compared them with virus collected in England and the USA.



Leaf spot symptoms



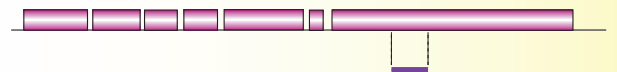
Sequence comparison of RMoV, RLMV and RLSV



Raspberry vein chlorosis virus (RVCV) is a very common virus in the UK and Europe, and is spread by the small raspberry aphid *Aphis idaei*. The only available test for this virus is by grafting to specific raspberry cultivars and waiting to see if particular symptoms (yellowing of minor leaf veins) arise. This is a very time- and labour-intensive process.



Gene structure of rhabdoviruses



Region of replicase gene conserved among rhabdoviruses



Vein-clearing symptoms



Small raspberry aphids



Bacilliform (bullet-shaped) virus particles

Earlier work using electron microscopy suggested that RVCV might be a rhabdovirus (a particular type of virus with bullet-shaped particles). We were unable to find rhabdovirus sequences in infected plants but were able to find them in the vector aphid - rhabdoviruses have the ability to multiply within both plants and insects. Using information from these experiments we have been able to design a test using the RT-PCR technique which enables us to detect RVCV in plants by a very rapid method that avoids the need for plant grafting.



We have discovered a new virus that is associated with a fairly common pest of raspberries, the raspberry leaf and bud mite. These mites are less than 1mm in length and have been thought to cause significant disease in their own right. However, our discovery raises the possibility that the symptoms seen during mite infestation may actually be caused by the new virus.



Symptoms in tunnel-grown Glen Ample plants



Expected genetic structure - sequence obtained so far is in blue

We only have partial sequence information for this virus but we expect it to have similarities with a number of other mite-transmitted viruses that have recently been found to occur in fig, wheat, rose and pigeonpea plants. Using RT-PCR we can detect this virus in raspberries and we are studying its geographical distribution in cultivated and wild raspberry, as well as its transmission characteristics.