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# plant disease

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## Disease Notes

### First Report of Zebra Chip Disease and "Candidatus Liberibacter solanacearum" on Potatoes in Oregon and Washington State

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In August of 2011, potato (*Solanum tuberosum*) tubers grown in the lower Columbia Basin of southern Washington State and northern Oregon were observed with internal discolorations suggestive of zebra chip disease (ZC). Symptoms included brown spots, streaks, and stripes in and near the vascular tissue, typical of ZC (1). Symptoms were observed in cvs. Alturas, Russet Norkotah, Pike, Ranger Russet, Umatilla Russet, and Russet Burbank. Foliar symptoms on plants that produced symptomatic tubers included purple discoloration in upper leaves, leaf rolling, axial bud elongation, chlorosis, leaf scorch, and wilt. Tissue was taken from two symptomatic tubers each of cvs. Alturas and Russet Norkotah, three tubers of cv. Umatilla Russet, and one tuber of cv. Pike. These tubers were tested by PCR for "Candidatus Liberibacter solanacearum", an unculturable alphaproteobacterium associated with ZC (1,4). Primers specific for the 16S rDNA were CLipoF (4) and OI2c (3), and primers OMB 1482f and 2086r were specific for the outer membrane protein (2). All of these samples, except one Umatilla tuber, were positive for the bacterium. The 16S rDNA and OMB amplicons from one symptomatic tuber each of Alturas (from Washington) and Pike (from Oregon) were cloned and three clones of each were sequenced. BLAST analysis of the consensus sequences confirmed "Ca. L. solanacearum". The 16S sequences (1,071 bp) from the two tubers were identical and showed 99 to 100% identity to a number of 16S rDNA sequences of "Ca. L. solanacearum" in GenBank (e.g., Accession Nos. HM246509 and FJ957897). The 16S rDNA sequences were deposited in GenBank as Accession Nos. JN848751 and JN848753. Consensus sequences of the two OMB clones (605 bp; deposited in GenBank as Accession Nos. JN848752 and JN848754) were identical and showed 97% identity to the two "Ca. L. solanacearum" OMB sequences in GenBank (Accession Nos. CP002371 and FJ914617). Potato psyllids (*Bactericera cockerelli* Sulc), the vector of "Ca. L. solanacearum", were present in ZC-affected fields in Oregon and Washington and the bacterium was confirmed by PCR in 5 to 10% of 128 adult psyllids collected from two fields. On the basis of foliar and tuber symptoms, specific PCR amplification with two primer pairs, sequence analyses, and the presence of Liberibacter-infected potato psyllids, ZC and "Ca. L. solanacearum" are present in potatoes in Oregon and Washington State. Washington and Oregon together grow ~80,000 ha of potatoes. ZC has caused significant economic damage to potatoes in Texas, Mexico, Central America, and New Zealand (1). Therefore, ZC may pose a risk to agriculture in Oregon, Washington, and neighboring states. However, the potential for development of widespread and serious disease will depend upon the arrival time and number of infective potato psyllids entering the region.

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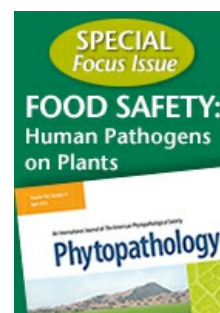
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