Tomato gene may fend banana against formidable fungus

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(PhysOrg.com) -- Proteins from the fungus *Cladosporium fulvum*, which causes leaf blight in tomato plants, are very similar to the proteins of the fungus Mycosphaerella fijiensis, which causes the much-feared black Sigatoka disease in the banana. This paves the way for using genetic modification to build resistance into the banana via the tomato, report Wageningen phytopathologists in *PNAS* this week.

Researchers have hitherto thought that the arms race between plant diseases and their hosts - pathogen attacks plant, plant develops resistance, pathogen overpowers resistance, etc. - is species specific. However, Ioannis Stergiopoulos, postdoctoral researcher in Pierre de Wit's research team and first author of the article, has now shown that different fungal diseases in various plants have the same ancestor. 'That is remarkable', says co-author Harrold van den Burg. 'The fungal diseases in tomato plants, grain crops and banana plants are very closely related, although the plants have had their own development history for millions of years.'

Not only do the fungi have a common base from which they infect various plants, Van den Burg says that these plants may also have a common resistance gene which recognizes these fungal pathogens and prevents them from causing diseases.

Since the Cf resistance gene can successfully protect the tomato against C. fulvum strains which produce a certain protein, the researchers postulate that this gene also gives good protection against M. fijiensis

strains which produce a similar protein. They would test their theory by building this tomato Cf gene into the banana to see whether the latter becomes resistant against the black Sigatoka fungus. 'We are running these tests currently', says Van den Burg. 'We are working with a transgenic crop since a tomato gene has been introduced into the banana.'

Currently, there is no known resistance against black Sigatoka in Cavendish bananas, the commonly consumed banana variety. Therefore, banana plantations use fungicides fifty to seventy times annually. Banana is a monoculture and a very vulnerable crop.

The article in *PNAS* is the result of a joint effort by Pierre de Wit, a specialist in *Cladosporium fulvum*, the causal agent of the tomato leaf mould disease, and Gert Kema of Plant Research International, specialist in the Mycosphaerella fungus. In the past few years both research teams have joined forces to find novel strategies to protect crop plants against devastating diseases like the black Sigatoka of banana.

Provided by Wageningen University