



## Erosion of quantitative host resistance in the apple × *Venturia inaequalis* pathosystem

Submitted by Emmanuel Lemoine on Thu, 02/12/2015 - 13:18

Titre	Erosion of quantitative host resistance in the apple × <i>Venturia inaequalis</i> pathosystem
Type de publication	Article de revue
Auteur	Caffier, Valérie [1], Lasserre-Zuber, Pauline [2], Giraud, Michel [3], Lascostes, Matthieu [4], Stievenard, René [5], Lemarquand, Arnaud [6], Van de Weg, Eric [7], Expert, Pascale [8], Denancé, Caroline [9], Didelot, Frédérique [10], Le Cam, Bruno [11], Durel, Charles-Eric [12]
Editeur	Elsevier
Type	Article scientifique dans une revue à comité de lecture
Année	2014
Langue	Anglais
Date	2014/10
Pagination	481 - 489
Volume	27
Titre de la revue	Infection, Genetics and Evolution
ISSN	1567-1348
Mots-clés	Aggressiveness [13], apple scab [14], durability [15], Epistasis [16], <i>Malus × domestica</i> [17], Partial resistance [18]
Résumé en anglais	<p>Theoretical approaches predict that host quantitative resistance selects for pathogens with a high level of pathogenicity, leading to erosion of the resistance. This process of erosion has, however, rarely been experimentally demonstrated. To investigate the erosion of apple quantitative resistance to scab disease, we surveyed scab incidence over time in a network of three orchards planted with susceptible and quantitatively resistant apple genotypes. We sampled <i>Venturia inaequalis</i> isolates from two of these orchards at the beginning of the experiment and we tested their quantitative components of pathogenicity (i.e., global disease severity, lesion density, lesion size, latent period) under controlled conditions. The disease severity produced by the isolates on the quantitatively resistant apple genotypes differed between the sites. Our study showed that quantitative resistance may be subject to erosion and even complete breakdown, depending on the site. We observed this evolution over time for apple genotypes that combine two broad-spectrum scab resistance QTLs, F11 and F17, showing a significant synergic effect of this combination in favour of resistance (i.e., favourable epistatic effect). We showed that isolates sampled in the orchard where the resistance was inefficient presented a similar level of pathogenicity on both apple genotypes with quantitative resistance and susceptible genotypes. As a consequence, our results revealed a case where the use of quantitative resistance may result in the emergence of a generalist pathogen population that has extended its pathogenicity range by performing similarly on susceptible and resistant genotypes. This emphasizes the need to develop quantitative resistances conducive to trade-offs within the pathogen populations concerned.</p>

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DOI [10.1016/j.meegid.2014.02.003](https://doi.org/10.1016/j.meegid.2014.02.003) [20]  
Lien vers le document <http://dx.doi.org/10.1016/j.meegid.2014.02.003> [20]  
Titre abrégé Infection, Genetics and Evolution

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## Liens

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Publié sur *Okina* (<http://okina.univ-angers.fr>)