

Identification, characterisation and mapping of resistance to black rot (*Xanthomonas campestris* pv. *campestris*) in *Brassica* spp.



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Introduction

Xanthomonas campestris pv. *campestris* (Xcc) is a gram-negative bacteria that causes black rot of brassicas.

Xcc causes considerable yield losses in vegetable brassicas and whilst currently not a major pathogen of oilseed rape (*Brassica napus*), reports of infection are on the increase in the crop^[1].

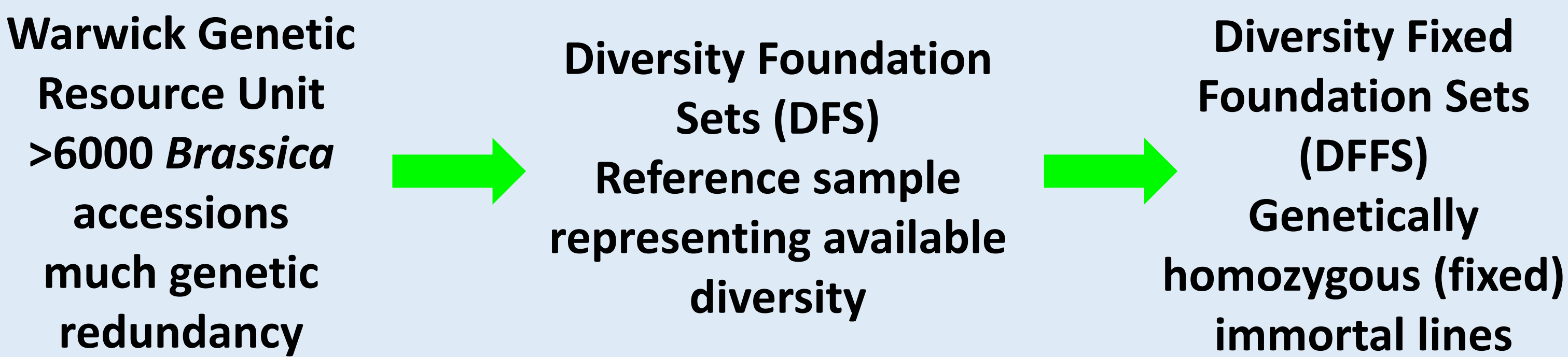
Host resistance to Xcc is required due to the lack of effective bactericides.



Figure 1. *Brassica napus* (oilseed rape) plants showing symptoms of *Xanthomonas campestris* pv. *campestris* infection.

Xcc resistance gene mapping

1. *Brassica napus*, *Brassica oleracea* and wild relative Diversity Fixed Foundation Sets (DFFS)



Screen for resistance against the most important Xcc races 1, 4, 5 and 6

2. Identify plant lines with specific and broad spectrum resistance to Xcc races

Table 1. Phenotypes of *B. napus* DFFS lines after challenge with four races of *Xanthomonas campestris* pv. *campestris*.

Resistance status	No. individuals			
	Race 1	Race 4	Race 5	Race 6
Susceptible	134	44	144	138
Partially Resistant	16	17	8	7
Resistant	0	93	2	0
Inconclusive	39	35	35	44

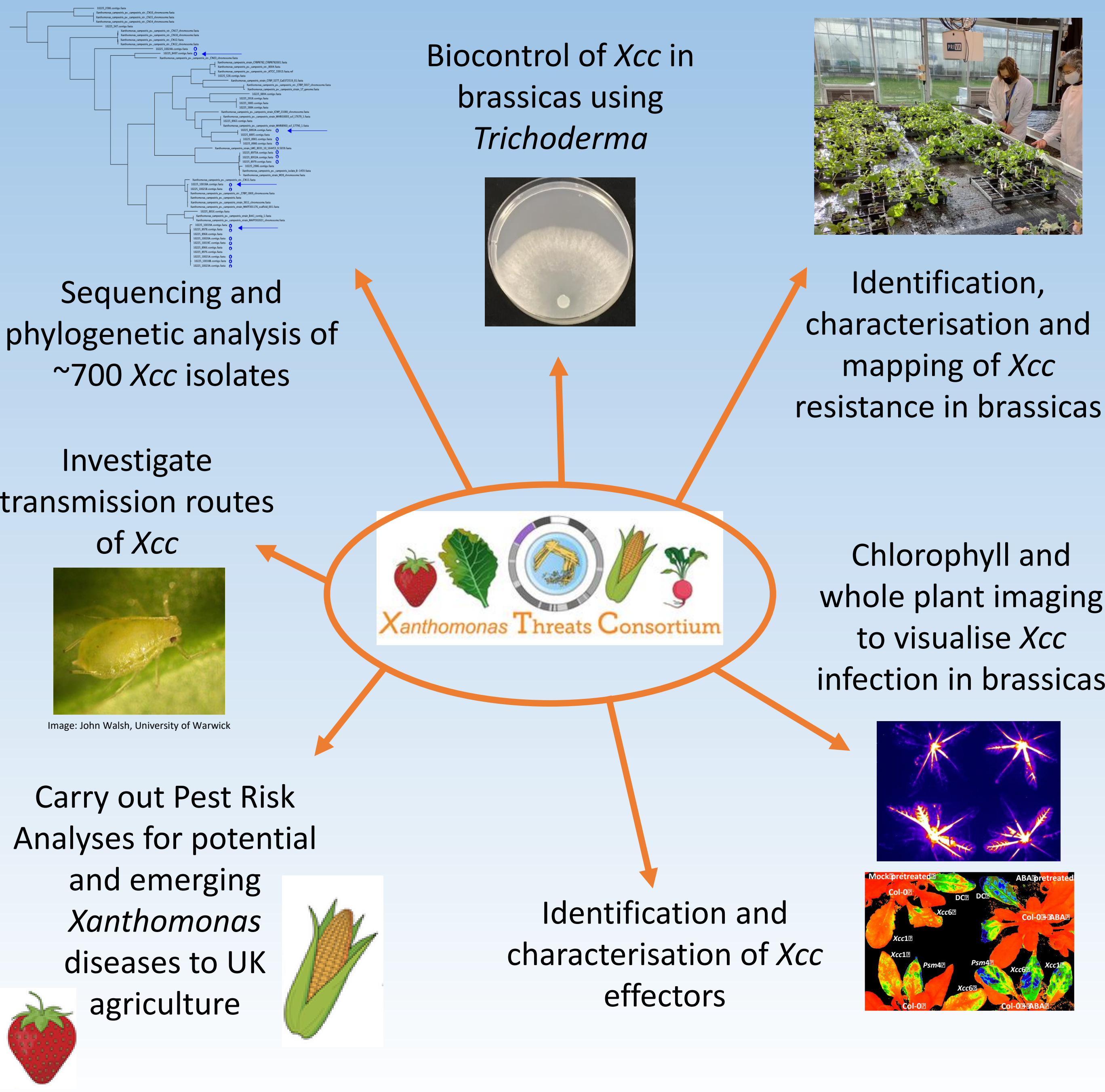
Map resistance to Xcc races using GWAS or QTL mapping

3. Identification of candidate Xcc resistance genes and Xcc resistance-linked genetic markers



Figure 2. High density SNP map derived from the RIPR and OREGIN mRNA-seq data sets of the *B. napus* DFFS^[2]. These markers will be used to map Xcc resistance in *B. napus* by GWAS.

Project objectives



References:

[1] Jelušić, A., T. Berić, P. Mitrović, I. Dimkić, S. Stanković, A. Marjanović-Jeromela and T. Popović (2021). New insights into the genetic diversity of *Xanthomonas campestris* pv. *campestris* isolates from winter oilseed rape in Serbia. *Plant Pathology*, **70**, 35-49.
Jelušić, A., T. Berić, P. Mitrović, I. Dimkić, S. Stanković, A. Marjanović-Jeromela and T. Popović (2021). "New insights into the genetic diversity of *Xanthomonas campestris* pv. *campestris* isolates from winter oilseed rape in Serbia." *Plant Pathology* **70**(1): 35-49.

[2] York Oilseed Rape Knowledgebase (2016). RIPR and OREGIN mRNA-seq data sets. Retrieved 01.06.2021 from [Yorkknowledgebase - Resources](https://yorkknowledgebase.co.uk/resources)