

Combined high level resistance to *Sclerotinia sclerotiorum* and *Pseudocercospora capsellae* in introgression lines derived from hybridization between *Brassica carinata* and *B. napus*

M.P. You¹, S.S. Banga², S.K. Banga², M.B. Uloth¹, N. Gunasinghe¹, P.M. Finnegan¹, P.A. Salisbury³, M.J. Barbetti^{1,4}

¹ School of Plant Biology, Faculty of Science, The University of Western Australia, 35 Stirling Highway, Crawley, W.A. 6009, Australia

² Department of Plant Breeding and Genetics, Punjab Agricultural University, Ludhiana, 141004 Punjab, India

³ Melbourne School of Land and Environment, University of Melbourne, Victoria 3010, Australia

⁴ The UWA Institute of Agriculture, Faculty of Science, The University of Western Australia, Crawley, Western Australia 6009, Australia

Contacts: martin.barbetti@uwa.edu.au, phone : +61 8 64883924

Sclerotinia stem rot (*Sclerotinia sclerotiorum*, SSR) is a serious threat to oilseed rape (*Brassica napus*) production in regions of Asia, Europe, North America and Australia. White Leaf Spot (*Pseudocercospora capsellae*, WLS) is also an important disease worldwide. In Australia, after blackleg disease (*Leptosphaeria maculans*, *L. biglobosa*), SSR is considered the next most serious disease, also threatening sustainable production of oilseed rape in some regions. WLS became particularly prevalent and severe in Australia during the deployment across 2000–2008 of single dominant gene-based resistance against *L. maculans* derived from *B. rapa* ssp. *sylvestris*. There is keen interest to identify sources of resistance, in particular to SSR, but also to WLS, especially where the two coincide together and where there is a need for high levels of SSR plus WLS resistance. Using field stem inoculation at 50% flowering with *S. sclerotiorum*, and sequential conidial inoculations with *P. capsellae* during the growing season, 54 *B. napus* genotypes carrying *B. carinata* introgression were tested in the field within a nylon insect-proof mesh tent.

SSR severity was assessed as stem lesion length 3 weeks post inoculation, while WLS severity was assessed on a 0–10 scale separately for both incidence and severity throughout the season. A range of varietal reactions occurred among tested genotypes in response to inoculation with either pathogen, ranking from highly susceptible (lesion length ≥ 36 mm SSR; score ≥ 5 for severity of WLS) to highly resistant (lesion length ≤ 10 mm SSR; score ≤ 2 for severity of WLS). Fourteen of the tested genotypes showed combined resistance to both SSR (lesion length ≤ 10 mm) and WLS (severity score ≤ 2), providing the first combined high level resistance against both diseases within the one genotype, offering new opportunities for oilseed *Brassica* breeding programs to rapidly develop new varieties with combined SSR plus WLS resistance.