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Identification of *Brassica juncea* germplasm resistant to *Sclerotinia sclerotiorum* and study of inheritance in early generations

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PLENARY TALKS

Sclerotinia sclerotiorum is a fungal plant pathogen affecting numerous crop species worldwide including all Brassica oilseed species grown in India. Infection occur during flowering when airborne ascospores colonize fallen petals adhering to stems and leaves. Infection of the main stem results in most yield loss which can reach 80%. Management of the disease by crop rotation has limited success due to the pathogen's wide host range and long-term survival of resting bodies (sclerotia) in the soil. Fungicide treatment is often uneconomical since the decision to spray has to be made before symptoms can be seen; also, weather conditions after application affects the rate of disease development. To mitigate sclerotinia stem rot, our long term objective is to develop *B. juncea* varieties resistant to *S. sclerotiorum*. Initially, 5442 *B. juncea* germplasm lines were screened for resistance in two consecutive cropping seasons between 2016 and 2018 in field plots using a stem inoculation method that simulates natural infection. Briefly, mycelium of a virulent isolate, ESR1, was grown on nutrient media in Petri dishes. Plants at full flower were inoculated by attaching mycelium plugs to the main stem with Para film. The lesion lengths were measured after three weeks. The most susceptible genotypes developed up to 500 mm lesions resulting in plant death. In contrast, the following nine *B. juncea* lines did not develop lesions, RH1222-28, EC597328, EC766553, EC766620, EC765048, IC492687, IC492690, IC492695 and IC511651. Two of these lines were crossed with high yielding *B. juncea* varieties and other lines resistant to white rust. F1 plants in RH1222-28 x RH406 and F2 plants in EC597328 x RH749 showed high level of resistance to *S. sclerotiorum* in the stem test described above showing that stem resistance is heritable and likely dominant. We are in the process of mapping quantitative trait loci (QTL) conferring resistance to sclerotinia using populations of recombinant inbred lines (RIL) derived from the two crosses. Molecular markers around the QTLs will facilitate development of *Sclerotinia* resistant *B. juncea* varieties.

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