



APHID RESISTANCE IN BRAZILIAN HEXAPLOID WHEAT DOES NOT CORRELATE WITH LEVELS OF THE BENZOXAZINOID NATURAL PRODUCT DIMBOA.

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Chemical control has been widely used for the control of aphid pest in Brazilian wheat (*Triticum aestivum* L.) production but due to development of insecticide resistance, and the prohibitive cost of insecticide use on family-run farms, sustainable and affordable solutions for wheat production are required. Plant secondary metabolism, accessed from biodiversity resources beyond current elite cultivars, offers a source of novel interventions for pest control, based on small lipophilic molecule (SLM) signalling, which can be delivered by the seed [refs]. Here, we report on our initial experiments to deliver new aphid resistance in Brazilian wheat based on SLM signalling, using aphid performance (phenotyping) assays and reverse-phase HPLC analysis. In phenotype assays that measured the mean relative growth rate of the grain aphid, *Sitobion avenae* and *Rhopalosiphum padi*, eight selected Brazilian wheat genotypes were ranked in terms of successful aphid development (BR 32, BRS 327, BRS 328, BRS Guabiju, BRS Guamirim, BRS Parrudo, PF869120 and BRS Timbaúva) and one UK variety (Solstice). Reverse-phase HPLC analysis showed variation in the levels of the benzoxazinoid DIMBOA, varied from 5.38 to 32.56 Mmol.KgFW⁻¹ in BRS Guabiju and Parrudo respectively. Although BRS Guabiju was also among the genotypes with the highest intrinsic rate of population increase (*r_m*) and BRS Parrudo showing low percentage of *r_m* (compared with Solstice) against both aphid species, levels of DIMBOA did not correlate with intrinsic rate of increase. There was no clear correlation between aphid performance and DIMBOA levels. These data suggest the presence of an alternative resistance mechanism to that of DIMBOA, which is currently being explored with the help of a novel artificial diet assay and bioassay-guided fractionation.

Refs

1. Pickett et al, 2014, Phil Trans Roy Soc B, 369, 20120281
2. Birkett and Pickett, 2014, Curr Opin Plant Biol 19, 59