research highlights

STRIGA RESISTANCE

Cloak the strigolactone

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The parasitic weed *Striga* is a major threat to sorghum production in tropical Africa and Asia, negatively affecting the livelihoods of hundreds of million people. Fortunately, *Striga* resistance already exists in sorghum germplasm although the molecular basis remains unclear. Previously, Gebisa Ejeta's group at Purdue University identified a region on sorghum chromosome 5, *LGS1*, containing gene(s) associated with low *Striga* germination stimulant activity. Now the researchers have examined the genetic and biochemical mechanisms underlying this *Striga* resistance.

Striga detects its proximity to sorghum roots by sensing strigolactones in sorghum root exudates. 5-Deoxystrigol and

orobanchol are two known strigolactones with opposite stereochemistry, displaying high and low *Striga* germination stimulant activities, respectively. The researchers found that the highly *Striga*-resistant sorghum lines displayed reduced 5-deoxystrigol but increased orobanchol levels in the root exudates compared to the wild type. The shift in

the type of strigolactone does not alter other strigolactone functions, such as related to tillering or symbiosis with arbuscular mycorrhizal.

Co-segregation analysis using additional molecular markers and sequence analyses narrowed the *LGS1* down to a gene encoding a sulfotransferase with an enriched expression in the roots. The low germination stimulant lines all exhibited deletion or disruptive mutations in this gene. As such, this sulfotransferase is probably involved in stereocontrol of the strigolactone molecular structure and its functional deletion results in the preferential production of orobanchol in the mutants.

These findings deepen our understanding of the molecular basis of *Striga* resistance in sorghum and the protection mechanism might be applied in other cereal crops.

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