

## Abstract

Sorghum is a major food staple in sub-Saharan Africa (SSA), but its production is constrained by the parasitic plant *Striga* that attaches to the roots of many cereals crops and causes severe stunting and loss of yield. Away from cultivated farmland, wild sorghum accessions grow as weedy plants and have shown remarkable immunity to *Striga*. We sought to determine the extent of the resistance to *Striga* in wild sorghum plants. Our screening strategy involved controlled laboratory assays of rhizotrons, where we artificially infected sorghum with *Striga*, as well as field experiments at three sites, where we grew sorghum with a natural *Striga* infestation. We tested the resistance response of seven accessions of wild sorghum of the aethiopicum, drummondii, and arundinaceum races against N13, which is a cultivated *Striga* resistant landrace. The susceptible control was farmer-preferred variety, Ochuti. From the laboratory experiments, we found three wild sorghum accessions (WSA-1, WSE-1, and WSA-2) that had significantly higher resistance than N13. These accessions had the lowest *Striga* biomass and the fewest and smallest *Striga* attached to them. Further microscopic and histological analysis of attached *Striga* haustorium showed that wild sorghum accessions hindered the ingress of *Striga* haustorium into the host endodermis. In one of the resistant accessions (WSE-1), host and parasite interaction led to the accumulation of large amounts of secondary metabolites that formed a dark coloration at the interphase. Field experiments confirmed the laboratory screening experiments in that these same accessions were found to have resistance against *Striga*. In the field, wild sorghum had low Area under the *Striga* Number Progressive curve (AUSNPC), which measures emergence of *Striga* from a host over time. We concluded that wild sorghum accessions are an important reservoir for *Striga* resistance that could be used to expand the genetic basis of cultivated sorghum for resistance to the parasite.