

Microbial-Induced Barriers To Striga Parasitism

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ABSTRACT

Researchers at the University of California, Davis have discovered an *Arthrobacter* bacterial strain that promotes suberization of the endodermis in sorghum roots. Suberin, a poly-fatty acid polymer, acts as a physical barrier in sorghum roots, helping to prevent infection by the parasitic plant *Striga hermonthica*, a significant threat to sorghum production. These microbial-based solutions offer a cost-effective and easily deployable strategy to manage *Striga* infection in the predominantly smallholder farmer-driven sorghum cultivation of sub-Saharan Africa.

FULL DESCRIPTION

Sorghum, a vital cereal crop in sub-Saharan Africa, frequently faces significant yield losses due to infestations by the parasitic weed *Striga hermonthica*. *Striga* attaches to sorghum roots and penetrates their tissues, causing reduced water and nutrient uptake, leading to wilting, stunted growth, and decreased yields. Existing *Striga* management methods have proven inefficient and challenging to integrate into traditional agricultural practices.

This technology identifies a novel approach to combat *Striga* infection by harnessing the power of beneficial soil microbes. UC Davis researchers discovered a soil microbiome that suppressed *Striga* infection in sorghum by increasing suberin content in the plant's root system. Mathematical modeling predicts the specific microbial genera responsible for this suppression. Among the selected candidates, an *Arthrobacter* strains was highly effective at inducing suberization of endodermis and exodermis, which strengthened the suberin barrier in sorghum roots.

APPLICATIONS

- ▶ Sorghum Agriculture: This technology can be applied to sorghum cultivation in sub-Saharan Africa, providing a cost-effective and accessible method for managing *Striga hermonthica* infestations, thus improving crop yields and food security.
- ▶ Microbial Inoculants: The *Arthrobacter* strain can be developed into microbial inoculants applied to sorghum seeds, seedlings, or soil to enhance the suberin barrier and protect the crop from *Striga* infestation.
- ▶ Plant Biotechnology: Advances the understanding of suberin deposition in plant roots, potentially leading to the development of genetically enhanced sorghum varieties with stronger suberin barriers.

FEATURES/BENEFITS

- ▶ Effective *Striga* Management: The technology offers an effective and sustainable solution for controlling *Striga hermonthica* infestations in sorghum, reducing crop losses, and improving food production.
- ▶ Affordable and User-Friendly: Microbial-based solutions are cost-effective and easy to implement, making them particularly suitable for smallholder farmers in sub-Saharan Africa.

PATENT STATUS

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Gene Editing for Improved Plant Characteristics via Modulation of Suberin Regulators](#)

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OTHER INFORMATION

KEYWORDS

sorghum, striga, microbial
inoculants, soil
microbiome, crop
protection, plant
biotechnology

CATEGORIZED AS

- ▶ **Agriculture & Animal Science**
 - ▶ Plant Traits
- ▶ **Biotechnology**
 - ▶ Food
 - ▶ Other

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