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Editorial Note

During Infection, *S. scitamineum* and *U. esculenta* have Confined Enzyme Activity at the Smut Gall

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EDITORIAL NOTE

The principal components of the plant cell wall are cellulose, hemicellulose, pectin, and lignin. The organisation and interactions of cell wall components are still unknown, and how cell wall organisation is adjusted to allow cells to expand and thrive, particularly in the presence of biotrophic fungal endophytes, is still a point of contention. It is a well-known fact that living creatures attempt to adapt to their surroundings by employing various techniques depending on the circumstances. Based on field observations and data on *S. scitamineum* and *U. esculenta* collected in the Indo-Burma biodiversity hotspot,

Smut fungus is hypothesised to go through a particular adaptation in their biota, where they have developed to be connected with various Poaceae plants. Due to the presence of a fungal endophyte, *Zizania latifolia* is a wild rice that does not produce rice grains. S. esculenta is limited to a few South East Asian environments. Surprisingly, the occurrence of *S. latifolia* in India is restricted to the swampy marshes and wetlands of Manipur's Imphal valley. Similar to *S. spontaneum*, *S. scitamineum* is a smut fungus that lives inside Saccharum spontaneum and is discovered in India's Indo-Burma biodiversity hotspot. The presence of *S. scitamineum* in the field causes the upper sections of *S. spontaneum* to expand and generate smut. Both *U. esculenta* and *S. scitamineum* infect their respective hosts, interfering with inflorescence and seed formation. The fungi *S. scitamineum* and *U. nigeri* are two of the most common

During biotrophic interactions, esculenta create localised infection in *S. spontaneum* and *Z. latifolia*, which develops into smut-gall. These fungi do not decompose the sclerenchymatous cells seen in the vascular bundles, according to advanced microscopic research. It's unclear whether these fungi lack cellulolytic, pectinolytic, or laccase capabilities, allowing them to just infect the smut-gall section of the afflicted plant systemically. The cellulolytic/pectinolytic/laccase activities of *S. scitamineum* and *U. esculenta* were determined in this work, and the differences in their enzymatic potential were correlated with evolutionary divergence. Fluorescence microscopy was used to investigate the distribution and area colonised by fungus inside the plant prior to the formation of smut gall. Using a Leica CM-3050S cryostat microtome, tissue slices of thickness 10-250 m from smut-gall were created.`

The interaction zones and sections containing *U. esculenta* were stained with 100% v/v calcofluor-white stain (CWS; Sigma® Saint Louis, USA), which binds to the cellulose components, according to the manufacturer's instructions. All of the observations were conducted using a fluorescent Olympus BX61 microscope with fluorescent filters and image pro plus software. The fungus was grown on Czapak Dox Agar (CDA) medium that included the following ingredients (gL^{-1}): 2.0% $NaNO_3$; 1.0% K_2HPO_4; 0.5% NaCl; 0.5% $MgSO_4.7H_2O$; 0.001% $FeSO_4.7H_2O$ (CMC). The culture plates were flooded with Gram's Iodine for 2-3 minutes after 2 days of incubation at 20°C and 30°C. The relative cellulolyte activity was used to determine positive activity.

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