POSTHARVEST FUNGAL INFECTIONS IN BITTER GOURD *(MOMORDICA CHARANTIA)* AND HOST DEFENCE RESPONSES

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The fruit of bitter gourd (*Momordica charantia* L.) is widely used as a vegetable in Sri Lanka and many Asian countries. In addition, leaves, stems, roots and fruits have important medicinal properties to control sugar level in blood, rheumatism and also exhibit antifungal, anticancer and antibacterial activity.

Microbial rotting during postharvest storage leads to serious losses in tropical and temperate fruit and vegetable produce world over. In developing countries over 25-50% of the harvest is lost due to postharvest rotting. This study reports the first record of postharvest fungal infections in bitter gourd. Bitter gourd was primarily infected by *Fusarium sp.* during postharvest storage. In addition, two other fungi, *Rhizopus sp.* and *Curvularia sp.* caused postharvest diseases.

Chemical and physical defense responses of a commodity at pre- and post-infection level are effective mechanisms against pathogens. Peel extracts of healthy bitter gourd bio assayed on TLC exhibited preformed antifungal activity against *Cladosporium cladosporioides* and *Fusarium sp.* The preformed antifungal activity decreased with increase in maturity in *M. charantia* variety "Thinnaweli White" (TW). The invasion by postharvest fungi indicates that antifungal compounds decrease below toxic level with maturity. Preformed antifungal activity was also detected in *M. charantia* variety "MC 43" at harvesting maturity, while
M. dioica variety "Thumbe Karawila" and *M. charantia* "Batu Karawila" did not exhibit any preformed antifungal activity. Phytoalexins were not detected as a result of *Fusarium* infection in bitter gourd in variety TW, while antibacterial activity against *E. coli* and *Bacillus sp.* was observed in extracts of the fruit peel.

In bitter gourd the fruit surface has a dentate nature, with ridges and furrows. Ridges are prone to damage during transport and handling, resulting in *Fusarium* rot, when compared to the furrows. A measurement of the cuticle and epidermal thickness revealed that these were significantly thicker ($p=0.05$) in the furrows, when compared to the ridges. This difference in cuticle and epidermal thickness, which act as a structural defence barrier may contribute to disease reduction in the furrows.

The pH of the host environment has been found to be a regulatory factor in pathogenesis of certain fungi. Some fungi are known to reduce host pH, while others tend to increase the pH during invasion. *Fusarium* infection increased the host pH to 8.5, while in healthy tissues it was 7, at the same level of fruit maturity.

This study records that chemical and physical defence response in fruits of *Momordica charantia* that are effective against pathogenesis at harvesting maturity, are lowered during storage resulting in postharvest diseases.