

Oral presentation: 44

A disease severity index to monitor stem-end rot development in Mango (cv. Karutha Colomban) and the assessment of pathogenicity of associated pathogens

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Mango (*Mangifera indica* L.) is a renowned tropical fruit consumed in Sri Lanka. Significant postharvest losses of mango are caused by diseases which affect the quality of fruits. Stem-end rot (SER) of mango is a disease caused by a group of fungal pathogens. Disease severity indices are important for assessing the extent of damage caused by a disease to develop suitable control strategies. An index was developed to evaluate the disease development and the level of severity of SER in mango (cv. Karutha Colomban (KC)). Pathogenicity of four fungi isolated from mango with SER was also investigated to find out their contribution for SER development in mango. Four mango fruits (90-days old) washed in tap water followed by sterile distilled water were placed on a plastic tray at room temperature. One selected fruit showing a gradual development of SER was photographed daily. Diseased area of the fruit in each photograph was estimated by DIGIMIZER (Version 5.3.4) software and the disease severity was determined as percentage SER (%SER). An index was prepared using the photographs with percentage SER values. Four fungal pathogens (*Lasiodiplodia theobromae*, *Phomopsis* sp., *Pestalotiopsis* sp. and *Xylaria feejeensis*) were isolated from mango with SER and their identity was confirmed by PCR using universal primers (ITS1 and ITS4) and DNA sequencing. Healthy mango fruits (90-day old) washed in tap water were surface sterilized with 0.1% sodium hypochlorite and subsequently washed in sterile distilled water. Stem-ends of the fruits were wound inoculated with 7-day old mycelial plugs of each fungal pathogen separately and all four pathogens together. Fresh PDA plugs served as the control. Inoculated fruits were incubated in moist plastic chambers at room temperature for 7 days. Each treatment comprised of four replicates and the experiment was repeated. Percentage SER of each fruit was determined based on the developed index. Mean percentage SER resulted by the combination of all four pathogens and *L. theobromae*, *Pestalotiopsis* sp. and *X. feejeensis*, separately were found to be $67.00 \pm 4.77\%$, $66.75 \pm 3.84\%$, $61.13 \pm 3.32\%$ and $60.38 \pm 4.58\%$ respectively and there was no significant difference between their pathogenicity (MINITAB 18). The least pathogenicity ($16.50 \pm 1.66\%$) was observed in fruits inoculated with *Phomopsis* sp. and percentage SER of the control was $0.88 \pm 0.23\%$. *L. theobromae*, *X. feejeensis* and *Pestalotiopsis* sp. were identified as the major contributors for SER in mango and this may be the first reported evidence in Sri Lanka on *X. feejeensis* as a potential SER pathogen of mango (cv. KC).

Keywords: Disease severity index, mango, pathogenicity, percentage SER, stem-end rot

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