

Isolation, Identification and Screening of Pectinase Producing Fungi Isolated from Apple (*Malus Domestica*)

Authors : Shameel Pervez, Saad Aziz Durrani, Ibatsam Khokhar

Abstract : Pectinase is an enzyme that breaks down pectin, a compound responsible for structural integrity of the plant. Pectin is difficult to break down mechanically and the cost is very high, that is why many industries including food industries use pectinase enzyme produced by microbes for pectin breakdown. Apple (*Malus domestica*) is an important fruit in terms of market value. Every year, millions of apples are wasted due to post-harvest rot caused by fungi. Fungi are natural decomposers of our ecosystem and are infamous for post-harvest rot of apple fruit but at the same time they are prized for their high production of valuable extracellular enzymes such as pectinase. In this study, fungi belonging to different genus were isolated from rotten apples. Rotten samples of apple were picked from different markets of Lahore. After surface sterilization, the rotten parts were cut into small pieces and placed onto MEA media plates for three days. Afterwards, distinct colonies were picked and purified by sub-culturing. The isolates were identified to genus level through the study of basic colony morphology and microscopic features. The isolates were then subjected to screening for pectinase activity on MS media to compare pectinase production and were then subsequently tested for pathogenic activity through wound suspension method to evaluate the pathogenic activity of isolates in comparison with their pectinolytic activity. A total of twelve fungal strains were isolated from rotten apples. They were belonging to genus *Penicillium*, *Alternaria*, *Paecilomyces* and *Rhizopus*. Upon screening for pectinolytic activity, isolates Pen 1, Pen 4, and Rz showed high pectinolytic activity and were further subjected to DNA isolation and partial sequencing for species identification. The results of partial sequencing were combined with in-depth study of morphological features revealing Pen 1 as *Penicillium janthinellum*, Pen 4 as *Penicillium griseofulvum*, and Rz as *Rhizopus microsporus*. Pathogenic activity of all twelve isolates was evaluated. *Penicillium* spp. were highly pathogenic and destructive and same was the case with *Paecilomyces* sp. and *Rhizopus* sp. However, *Alternaria* spp. were found to be more consistent in their pathogenic activity, on all types of apples.

Keywords : apple, pectinase, fungal pathogens, *penicillium*, *rhizopus*

Conference Title : ICMFFB 2024 : International Conference on Mycology, Fungi and Fungal Biology

Conference Location : Karachi, Pakistan

Conference Dates : December 30-31, 2024