

Mitigating Heart Rot or Black Heart Deterioration of Pomegranates Caused by Storage Fungi by use of Essential Oils

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Abstract: Pomegranate (*Punica granatum*) is very important and nutritious fruit crop. India is leading producer and exporter of pomegranate. In India Maharashtra is leading producer of pomegranate. Due to its nutritional and export value its demand is increasing. As the moisture content is very high in freshly harvested fruits about 20% fruits are damaged during transport and storage by fungi. It is observed that inside of the fruit are becoming black and aril are decaying. This disease is known as heart rot or black heart. This rot is due to certain fungi such as *Alternaria alternata* Keissler, *Aspergillus niger* van Tieghem, *Botrytis cinerea* Pers, *Penicillium glabrum* Wehmer and *Pilidiella granati*. The infection in pomegranates takes place when flowers are opened and anther dehiscence is going to start. The conidia of *Alternaria* travel together with pollen grains during pollination. The fungus enters the fruit through the tunnel in style into the interior of the fruit. From tunnels they enter into the locules of the fruits and deteriorate the aril of seeds converting them into black colours. Any strategy to control the black heart disease of pomegranate after harvesting the fruits will not be successful as the pathogen enters the host during flowering stage. Therefore spraying at flowering stage will surely be more beneficial approach. The most effective fungicides against heart rot or black heart of pomegranates are Inspire super, Switch, Inspire XT and Pristine. These fungicides are toxic to environment as well as human being. Therefore the purpose of our study is to search for harmless fungicides of plant origin which can be sprayed at the time of anthesis. Several essential oils isolated from higher plants are reported to have antifungal properties. Two essential oils isolated from lemon grass and eucalyptus were selected for antifungal testing against the four major fungi responsible for heart rot in pomegranate such as *Alternaria alternata* Keissler, *Aspergillus niger* van Tieghem, *Botrytis cinerea* Pers and *Penicillium glabrum* Wehmer. MIC and MCC of *Cymbopogon citratus* EO was $4.5 \mu\text{l ml}^{-1}$ and $5.0 \mu\text{l ml}^{-1}$, while MIC and MCC of *Eucalyptus citriodora* EO was $3.0 \mu\text{l ml}^{-1}$ and $3.0 \mu\text{l ml}^{-1}$ all the four test fungi. Oil combination test in 1:1 ratio was quite more effective controlling these fungi

Keywords: Minimum inhibitory concentration, Minimum cidal concentration, Essential oil

