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# Resin Canal Discolouration (RCD) – A Great Handling Disorder in Mango (*Mangifera indica* L.)

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## Abstract

In mango physiological disorders like flower drop, malformation, under skin browning (USB) and resin canal discolouration (RCD) were caused by nutritional insufficient and improper management practices during harvesting to storage. Among them, resin canal discolouration (RCD) was formed from exocarp (skin) to fleshy fruit portion (mesocarp) region. It was formed due to ecological imbalance of pressure between fruit and atmosphere during handling and transit stage. This canal browning discolouration was consisted with phenolic, starch substances associated with bacterial spp. of *Enterobacter* and *Pantoea*. It acts against to pest and pathogen's invasion and regulates the ethylene biosynthesis during fruit ripening. This discolouration causing severe reduction in marketable value and annoying experience in human diet. Following, proper farm practices from harvesting to storage to avoid the RCD and given the better money value for fruit merchants.

## Introduction

Mango (*Mangifera indica*) is one of the most important fruit crop in the world due to their delicious taste, easily available vitamins (A, B<sub>1</sub>, B<sub>2</sub>, B<sub>6</sub>, C & K), potassium and digestible fibre for human diet with health and called as “King of fruits”. It is belonging under family of Anacardiaceae. In India, it was cultivated around 2,312 thousand ha with production of 15.03 million tonnes, contributing 40.4% of world's total production and exported up to 40 countries around global wide. In states, viz., Uttar Pradesh (23.8%) recorded as highest producer followed by Andhra Pradesh (22.1%) in India. Under Tamil Nadu, places like Salem, Madurai, Theni, Dindigul, Dharmapuri, Vellore, Thiruvallur were highly cultivated mangoes with famous varieties viz., Malgoa, Neelum, Banganapalli, Alphonso, Rumani, Totapuri and Banglora. In mango production was drastically reduced by several constraints viz., pests (fruit fly, nut weevil, stem borer, hopper, mealy bug and scale insects), diseases like, (dieback, anthracnose, sooty mould, powdery mildew and blotch) and disorders of malformation, fruit drop and under skin browning (USB) also.

In recent days, during harvest to consumption stage some new physiological disorder was occurred and its great impact on mangoes quality changes and nature of mind set for purchasing behaviour of human in the markets. It was called as “Resin Canal Discolouration” (RCD). Naturally, it occurred 30-43% of prevalence in mangoes during harvest to storage and causing severe economic loss upto 30% during export under globally. This RCD was gradually decreased the uptake potential of mango in the human diet and it severe problematic issue for distribution and between consumption (Du Plooy *et al.*, 2006).

## Symptoms

**R**esin canal discolouration (RCD) was first reported in Australia on cultivar of “Kensington Pride”. Mostly the symptom was occurred during fruit picking to storage stage. The resin like canal or duct formed from fruit exocarp (skin) to pass into fleshy mesocarp portion like brown or dark reddish coloured and this discolouration was occurred due to resinous form of phenolic substances and accumulation of starch compounds in the fleshy portion. The resinous substances were enhanced the resistance against to herbivorous and pathogens invasion. The infected fruit’s upper portions (exocarp) were presented with numerous black dots. Sometimes, these resin canals occurred in the endocarp (seed) region also. When we cut the mango’s fleshy portion for eat, it creates the annoying experience of consumer and reduce the marketable value for sellers (Macnish, 2016).



Figure 1: Thread like RCD Appearance in Fruit Inner Portion



Figure 2: RCD Infected Mango Fruit

## Reasons

- Pre-mature pickup from field.
- Longevity period of transit from field to storage.
- These resin canals occurred due to accumulation of ecological- pressure between exocarp and atmosphere during transportation and handling.
- Some phytopathogenic bacteria viz., *Enterobacter* spp., *Pantoea stewartii* and *Pantoea agglomerans* were associated with it.
- Improper storage conditions like low O<sub>2</sub> / optimal CO<sub>2</sub>, light, up normal humidity and poor hygienic of storage godowns.

## Management

- Avoid pre-mature harvesting.
- Select the transit place from harvest to storage unit with low distance.
- Using the proper well skilled persons for picking and transporting.
- During pre-harvest stage spraying with mancozeb at 0.2%.
- Dipping fruits in hot water 52°C / 5 mins followed by application of plant wax (Waxol) at 8%.

## Conclusion

**I**n global wide, postharvest losses are playing a vital role in all agricultural and allied sectors. It creates problematic issues between producer and consumer due to quality and quantity of products. Resin canal discolouration (RCD) is mostly occurred due to improper handling and lack of storage facilities. The resin canal discolouration was made an annoying experience of human’s diet and suppressed the quality and price of value. So, we recommended to farmers and wholesalers of this issue by proper time of harvesting and using good hygienic pre-harvest and postharvest practices were given better results against RCD.

## References

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