

**SINGLE-FREQUENCY SOUND WAVE DELAYS TOMATO
(*Solanum lycopersicum*) RIPENING BY SUPPRESSING
RESPIRATION AND REGULATES LYCOPENE**

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ABSTRACT

1 KHZ SOUND WAVE TREATMENT DELAYS RIPENING AND REDUCES RESPIRATION RATE

Tomato had become one most consumed and utilized fruit. Tomatoes are cultivated, harvested and commercialized on a wide scale all over the world. This poses the question "Would the tomatoes last long?" Fresh tomatoes placed on a counter would only last for a week and extended for another week if stored in refrigerator at 23°C. The onset of senescence is triggered by ripening process. Ripening process in turn triggered by multitude of factors. The major factor known is the initiation of ethylene biosynthesis. The accumulation of ethylene would trigger multiple enzymatic processes along with multiple protein synthesis. The transition of chloroplasts into chromoplasts is driven by enzymatic action that results in the loss of green coloration among tomatoes. Carotenoids on the other hand are the main coloration pigments that give the orange and red coloration to tomatoes. Single-frequency sound wave at 1 kHz as the treatment agent of the project proved to have delays ripening process when applied to a group of tomatoes. The results showed a noticeable difference between controlled group and treated group. The color transitions from green to red of the tomatoes were considerably slower in treated group during the whole period of 15 days. The sound wave treatment also reduces the respiration rate of tomatoes as the head-space gas sample analyzed revealed that the amount of CO₂ was lower in the gas sample of treated group. The GC test showed those treated groups only have 0.39886% CO₂ content out of 50 mL gas sample taken. In contrast, controlled group's CO₂ content was 1.27148% with the same volume of gas sample. The result obtained proved that single-frequency sound wave at 1 KHz was capable of delaying ripening process as well as reducing respiration rate in tomatoes.

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