**Kinetics of quality changes in soaking water during the retting process of pepper berries (Piper nigrum L.)**


ABSTRACT

There are organic matters and bioactive compounds naturally present in pepper that may have leached out into the soaking water due to a prolonged retting process that caused changes in water quality. This study was carried out to determine the influences of different quantities of mature pepper berries and soaking time on the quality of soaking water during the retting process. The soaking test was conducted by having three tanks with different quantities of pepper berries soaked in the 18 L of water. The results show that the tank with the highest quantities of pepper berries has the highest increment of turbidity from 21.80 ± 1.90 NTU to 1103.30 ± 23.10 NTU (98%), the highest reduction in pH from 6.99 ± 0.02 to 3.67 ± 0.02 (47.50%), the highest reduction in dissolved oxygen from 5.19 ± 0.17 mg/L to 1.05 ± 0.02 mg/L (79.77%) and the highest increment of chemical oxygen demand from 21.67 ± 1.15 mg/L to 3243.33 ± 5.77 mg/L (99.33%) compared to other tanks. Furthermore, the zero, first and second-order kinetic models fitted well with the experimental data of the quality of soaking water for three conditions using the Arrhenius law approach. Thus, these findings are useful for estimating water quality during the retting process.



**Keyword:** Pepper; Retting; Soaking water; Kinetics; Quality changes