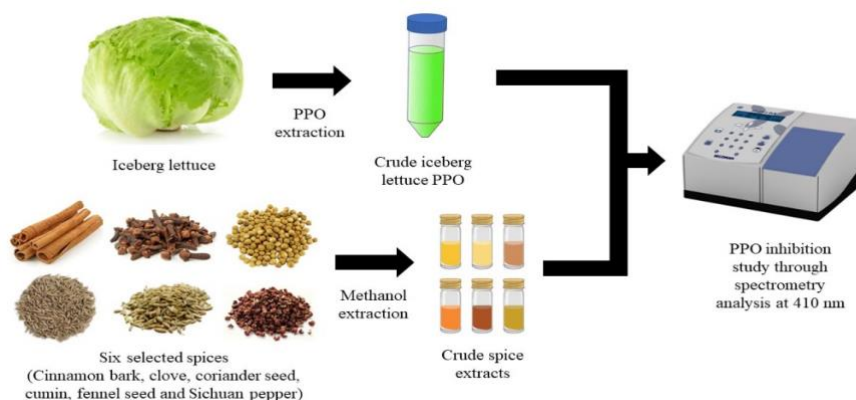


INHIBITORY EFFECT OF SELECTED SPICES ON POLYPHENOL OXIDASE FROM ICEBERG LETTUCE (*LACTUCA SATIVA* L.)Le Yi Yap¹, Zhi Zhou Siew¹ and Chen Wai Wong^{2✉}¹Department of Food Science with Nutrition, Faculty of Applied Sciences, UCSI University, Malaysia.²Department of Biotechnology, Faculty of Applied Sciences, UCSI University, Malaysia.✉ wongcw@ucsiuniversity.edu.my<https://doi.org/10.34302/crpjfst/2024.16.2.10>**Article history:****Received:** May 20th, 2024**Accepted:** June 25th, 2024**Keywords:***Polyphenol oxidase**Enzymatic browning**Iceberg lettuce**Spices**Inhibitor***ABSTRACT**

Food browning is an undesirable phenomenon that alters sensory properties and nutritional value of fresh-cut produce, which had a significant economic impact owing to decreased customer acceptability. In this study, the effect of selected spices including cinnamon bark, clove, coriander seed, cumin, fennel seed and Sichuan pepper on iceberg lettuce polyphenol oxidase (PPO) inhibition was investigated to replace synthetic browning inhibitor that often used by food manufacturers. Iceberg lettuce PPO has an enzyme activity of 13677.04 ± 21.00 EU/mL, using pyrocatechol as substrate. Ascorbic acid was used as the synthetic inhibitor of Iceberg lettuce PPO and it acted as a mixed inhibitor with the IC_{50} of 4.20 ± 0.19 mM. Among all the browning inhibition effect of the selected spices on Iceberg lettuce PPO, cinnamon bark was the best inhibitor among the six selected spice extracts, with the inhibition percentage of 32.39 ± 1.47 % inhibition was determined, followed by fennel seed (16.93 ± 1.47 %), Sichuan pepper (14.24 ± 0.83 %), cumin (13.72 ± 1.35 %), coriander seed (9.85 ± 0.75 %), and clove (9.64 ± 0.47 %) at 2.0 mg/mL. The present findings suggested the potential to expand the application of the spices to be used as food-based anti-browning inhibitors directly on the surface of iceberg lettuce as well as other fresh-cut produce or used as active ingredient of enzymatic browning-based active packaging of fresh-cut produce.



Graphical Abstract