

Bread Quality as Affected by Partial Substitution of Flour with Pili (*Canarium ovatum*, Engl.) Fruit Pomace Powder

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Abstract

Pili (*Canarium ovatum* Engl.) fruit pomace, a potential functional food ingredient, represents an underutilized source of dietary fiber and polyphenol antioxidants [1, 2]. In this study, pili fruit pomace powder (PPP) was used to replace a portion (1, 2 and 3%) of wheat flour in yeast bread formulation. Bread samples were assessed for their physicochemical, nutritional, baking and sensory properties. PPP substitution resulted in darker-colored breads with higher water activity and lower pH, along with increased ash and carbohydrate contents. The control formula (0% PPP) exhibited lower dietary fiber, total phenolics content and antioxidant activity. Moisture content and retention were greater in the experimental breads, resulting in improved baking yield and reduced baking loss but these breads were characterized as heavier and denser with lower volume. This is likely due to the PPP's fiber component as fiber competes with gluten for water, thereby minimizing gluten hydration which is essential for bread expansion. Accordingly, texture profile analysis increased hardness, chewiness and gumminess at higher PPP concentrations. Sensory evaluation revealed that PPP inclusion in bread significantly affected appearance only, while other attributes, including general acceptability, remained comparable to the control. Storage analysis demonstrated a practical shelf life of 3 days for all bread samples at ambient temperature. Evidence from this work establishes that low levels of PPP can boost bread functionality.

References

- [1] E.H. Arenas and T.P. Trinidad, "Fate of polyphenols in pili (*Canarium ovatum*, Engl.) pomace after in vitro simulated digestion", Asian Pacific Journal of Tropical Biomedicine, Vol. 7 (1), pp 53-58. 2017.
 - [2] E.H. Arenas and T.P. Trinidad, "Heavy metal and microbiological profiles of defatted pili (*Canarium ovatum*, Engl.) pulp meal residue and acute oral toxicity of its ethanolic extract in mice" International Food Research Journal, Vol. 24 (1), pp 1763-1770.
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