

## ABSTRACT

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### **EFFECT OF EXTRACTION METHOD ON ANTIOXIDANT CHARACTERISTICS OF SAPPANWOOD (*CAESALPINIA SAPPAN*L.) HEARTWOOD EXTRACT AND ITS INCORPORATION INTO HERBAL TEA**

(xii + 53 pages: 6 tables, 22 figures, and 12 appendices)

*Sappanwood (Caesalpinia sappan L.) is a potential functional food ingredient, and the production of extract is expected to increase the potency of its usage. This research was aimed to study the effect of extraction method on antioxidant characteristics of sappanwood heartwood extracts and their incorporation into herbal tea. Sappanwood heartwood was extracted using maceration and reflux with varying temperature and time regimes. The crude extracts were subjected to antioxidant activity, total phenolics, total tannin, total flavonoid, and colorimetric tests. One best candidate in terms of antioxidant activity from each extraction method was qualitatively assayed for the phytochemical constituents and incorporated into herbal tea. Maceration at 35 °C for 2 days and reflux at 90 °C for 3 hours resulted in extract with best antioxidant activity of  $IC_{50} = 9.7054$  and  $7.6963$  mg/L, respectively. The extracts were incorporated at varying concentrations in replacement of conventional bulk heartwood which served as a control, and were analyzed for their antioxidant activity. Linear regressions were used to estimate the amount of extract needed for each to achieve equal amount of antioxidant activity to the control. Extract concentrations of  $0.3612$  g/2.5 L and  $0.3420$  g/2.5 L were required for macerated and refluxed extracts respectively to achieve equal antioxidant activity to the control containing 22.5 g of bulk heartwood in 2.5 L of herbal tea formulation. The resultant product equivalents and control were then subjected to hedonic test and colorimetric test. Extract-incorporated formulations showed lighter yellow-red color and significantly higher color preference as compared to the control, but with no significant difference in terms of overall acceptance.*

**Keywords :** Sappanwood heartwood, *Caesalpinia sappan* L., extract, maceration, reflux, antioxidant, herbal tea

**References :** 48 (1990-2012)