

Abstract for the BioAsie Program Meeting  
'Extraction, characterization and optimization of bio-molecules from by-products of the Asian timber'  
25<sup>th</sup> to 27<sup>th</sup> April, 2017  
Université de Lorraine, Nancy, France

## **In Vitro Antioxidant and Physical Properties of Tropical Cream Formulations Containing a Combination of *Acacia mangium*, *Toona sinensis*, and *Centella asiatica* Leaf Extracts**

25 avril 2017, 10h00  
Faculté des Sciences et Technologie,  
Salle de réunion du LERMAB,  
entrée 4A, 3<sup>ème</sup> étage

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The objectives of this research were to determine the yield, total phenolic content, and antioxidant activity of *Acacia mangium* (EA), *Toona sinensis* (ET), and *Centella asiatica* (EC) leaf ethanolic extracts and to analyze the physical and in vitro antioxidant properties of topical cream formulations containing a combination of EA, ET, and EC in the ratio 1: 1: 2 (CLE). The ET and EA were obtained from the extraction of leaf powder in 90% ethanol and 50% ethanol. However, the EC was obtained from extraction of leaf powder in 70% ethanol. The topical cream formulations with oil-in water type consisted of 0.25, 0.5, and 1.0% CLE and 0, 30, 60 minutes of ultrasonication times. The results showed that the yield of ET, EA, and EC were 21, 14, and 14%. The total phenolic content, antioxidant activities, and sun protection factor (SPF) of ET, EA, EC, and CLE successively were 430, 138, 28, and 230.19 mg GAE/g dry weight, EC50 in 13, 29, 52, and 19 ug/ml), and SPF in 8, 10, 2.2, and 4.3. The formulations of topical cream influenced the antioxidant activities. the cream with 1% and ultrasonication time of 30 minutes became the best cream because this cream had the highest EC50 and SPF, successively were 365 ug/ml and SPF 2.8). This cream had higher antioxidant activities than commercial cream (EC503789 ug/ml). Therefore, the SPF of this formula had the lowest than commercial cream (SPF 16). The storage creams for 60 days at room temperature or refrigerated (refrigerators) did not significantly affect to the antioxidant activities and physical properties (pH, light, and viscosity).

