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Proanthocyanidins in inflorescence of *Cocos nucifera* L, an ayurvedic drug used in gynaecological disorders

C Padumadasa[1*], H D K Dharmadana[1], A M Abeysekera[1] and M Thammitiyagoda[2]
[1]*Department of Chemistry, University of Sri Jayewardenepura, Nugegoda*
[2]*Animal Centre, Medical Research Institute, Borella*

In Ayurveda, immature inflorescence of *Cocos nucifera* L is used to treat gynaecological disorders. Preliminary phytochemical screening has shown that the inflorescence of *Cocos nucifera* contains high levels of proanthocyanidins (PA). Literature on PA indicates that these compounds have oestrogenic activity. Extraction and purification of PA in *Cocos nucifera* inflorescence was carried out according to literature procedures, with modifications. The extraction procedure yielded two fractions named as low molecular weight PA (LMPA) and high molecular weight PA (HMPA). Both fractions were purified using chromatography on sephadex LH-20. The yield of LMPA fraction and HMPA fraction were 0.20% and 1.04% (by weight) of the fresh inflorescence. The total PA yield was 5.66% on dry weight basis. TLC analysis of the LMPA fraction on silica gel in the toluene:acetone:formic acid (3:3:1) solvent system, indicated the presence of oligomers with a degree of polymerization around the 4 – 6. TLC analysis of the acid hydrolyzate showed the presence of cyanidin in both fractions, indicating that catechin / epicatechin as the monomer unit. The HMPA comprised 81.6% of total PA. Therefore HMPA was used as the standard for the preparation of the calibration curve, which was drawn using six concentrations ranging from 0.0208 mg/ml – 0.2080 mg/ml. The acid butanol assay was performed according to the standard method. A linear calibration curve ($y = 5.153x + 0.013$) with $R^2 = 0.997$, was obtained, going through zero. The PA content of floral parts at different maturity stages was determined using the calibration curve and the results were expressed as HMPA equivalents. There is a significant difference in PA content at different maturity stages ($P < 0.05$). There is also a significant variation of PA content along the length of the inflorescence ($P < 0.05$). In all stages of development, the middle part contained the highest level of PA. The female flower has a higher PA content than the male flower and the rachilla has a higher PA content than rachis. The method described in this paper can be used to quantify the PA in the *Cocos nucifera* inflorescence, as HMPA equivalents. Our studies on the distribution of PA in *Cocos nucifera* inflorescence will provide useful information for standardizing the Ayurvedic therapy. Animal studies on the pharmacological activity of the *Cocos nucifera* inflorescence, and the correlation of the activity with PA content are under way.

chayanikapadumadasa@yahoo.com Tel: 0714492911