

**E2-07: Analysis of the  $\beta$ -carotene content of fresh and cooked samples of katu-kohila (*Lasia spinosa*) and wel-kohila (*Syngonium podophyllum*)**

Rohan P Perera<sup>1</sup>, Siddhika G Jayasundera<sup>1</sup>, Maya B Gunasekera<sup>1</sup>, A S Amarasekera<sup>2</sup>, T M S Atukorala<sup>2</sup>.

<sup>1</sup>Dept. of Chemistry, Univ. of Colombo, Colombo 3,

<sup>2</sup>Dept. of Biochemistry & Molecular Biology, Univ. of Colombo, Colombo 8)

The best known function of carotenoids is as a precursor of vitamin A. However, more recently, attention has been focused on the antioxidant properties of carotenoids. Provitamin A, cannot be synthesized in the animal body, and in developing countries, major part of the vitamin A requirement is met by plant sources. Of the carotenoids,  $\beta$ -carotene has the highest potency of vitamin A activity. Since  $\beta$ -carotene is sensitive to heat, oxygen

and light, it could be destroyed by food processing methods. Hence, the objectives of this study were to determine the  $\beta$ -carotene content of 2 varieties of kohila, and to find out which type of preparation of kohila, as consumed by man, would retain the highest amount of  $\beta$ -carotene present in the fresh leaf.

The  $\beta$ -carotene content of katu-kohila (*Lasia spinosa*) and wel-kohila (*Syngonium podophyllum*) samples, bought in Colombo, was determined by 2 methods, High Performance Liquid Chromatography (HPLC) and Alumina Column Chromatography (ACC). Three preparations of kohila samples were made: fresh leaves freeze-dried and extracted into 5% ethanolic KOH (A), extracted into distilled water and cooked at 80°C for 5 min (B) and extracted into coconut milk and cooked at 80°C for 5 min (C). All samples were then saponified at 60°C and the carotenoids were extracted into hexane. HPLC determination of  $\beta$ -carotene was carried out using a C18-5 reverse phase column and a solvent system of acetonitrile-dichloromethane-methanol (70:20:10). In the column chromatography method, a neutral column equilibrated with hexane was used to separate  $\beta$ -carotene from other carotenoids and the content of  $\beta$ -carotene was determined by spectrophotometry at 450nm.

The  $\beta$ -carotene content and the retinol equivalent (RE) obtained (per dry weight as well as per calculated wet weight) for the 3 preparations of katu-kohila and wel-kohila samples, by the 2 methods, are summarized in the table.

The  $\beta$ -carotene content of katu-kohila and wel-kohila determined by HPLC method was  $10100 \pm 182$ , and  $12569 \pm 891$   $\mu\text{g/g}$  of wet weight, respectively. While cooking of katu-kohila and wel-kohila in water reduced the  $\beta$ -carotene content of the fresh leaf by about 52% and 59% respectively, cooking in coconut milk contributed only to a loss of approximately 4.8% and 3%, respectively.

**Table  $\beta$ -carotene and retinol equivalent**

Sample*	Mean $\beta$ -carotene $\mu\text{g/g}$ of dry wt.		Calc. $\beta$ -carotene $\mu\text{g/g}$ of wet wt. #		RE** $\mu\text{g/g}$ of wet wt.		→
	HPLC	ACC	HPLC	ACC	HPLC	ACC	
<b>Katu-kohila</b>							
A	84149	1719	10100	914	1683	76	→
n1=12	±	±					
n2=11	1519	1.9					
B	39920	392	4792	208	798	42	→
n1=10	±	±					
n2=05	4615	2.7					
C	80129	835	9619	444	1603	50	→
n1=23	±	±					
n2=08	4678	2.0					
<b>Wel-kohila</b>							
A	104700	ND	12569	2094			→
n1=12	±						
	7423						
B	42170	ND	5062	843			→
n1=10	±						
	7940						
C	101540	ND	12189	2021			→
n1=12	±						
	6121						

\* n1 and n2 are the number of samples analysed by HPLC and ACC respectively.

# Wet weight of sample calculated from the mean moisture content (88%).

\*\*RE =  $\frac{\text{total carotene } \mu\text{g/g}}{12} + \frac{\beta\text{-carotene } \mu\text{g/g}}{6}$

12

6

ND -not done

A similar retention of  $\beta$ -carotene when cooked in coconut milk was also observed by the ACC method. Hence, the fat in coconut milk may give stability to  $\beta$ -carotene molecules during cooking at high temperatures. A major portion of the daily dietary requirement of vitamin A could therefore be obtained as  $\beta$ -carotene from kohila leaves cooked in coconut milk.