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Technical Sessions : A - 10

Some functional properties of *Ipomea batata* (sweet potatoes) cultivars for potential use in food industry

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Sweet potatoes are considered as a typical food security crop for Sri Lankans which can be considered as a low cost energy source. Water solubility index (WSI) and water absorption index (WAI) are used in food industry to find out if particular flour would be useful in the food systems and predict how the materials may behave if further processed. This study aims to make available the data on water solubility and water absorption index of six sweet potato varieties (in boiled and raw forms) consumed by Sri Lankans. Determination of water solubility and water absorption index of Ama, Wariyapola Red, Wariyaopla White, Shanthi, CARI 9 and CARI 426 was carriedout with flour of raw and freshly boiled (home cooked) sweet potatoes of the selected varieties. Determination of water solubility and water absorption index was done by standard methods.

Table 1: Water solubility and water absorption indices of boiled and raw *Ipomea batata* (sweet potatoes) cultivars (n=6), (mean± SD)

Variety	Water solubility index (%)		Water absorption index (%)	
	Raw	Boiled	Raw	Boiled
Ama	19.3 (±0.2)	36.0* (±1.6)	212 (±8.0)	377 (±9.8)
Wariyapola Red (WR)	30.5 (±0.2)	23.6 (±1.7)	221 (±4.8)	417 (±6.0)
Wariyapola White (WW)	21.5 (±0.2)	17.9 (±1.9)	211 (±2.0)	334 (±2.0)
Shanthi	31.6 (±0.6)	27.4 (±1.1)	215 (±5.9)	440* (±2.2)
CARI 9	29.2 (±1.5)	22.1 (±2.7)	237 (±5.6)	383 (±4.7)
CARI 426	31.5 (±1.1)	23.6 (±2.3)	236 (±5.8)	351 (±4.5)

In each column, *for indicate significant differences at $P < 0.05$

WSI of tested sweet potato varieties varied between 19-32% in raw forms and 17-36% in boiled forms. A significant increase in water solubility was observed in Ama due to boiling whereas in the other varieties WSI has decreased. WAI varied between 210-237% in raw forms and 330- 440% in boiled forms of sweet potato varieties. There was significant increase in WAI of all the varieties due to boiling. Among the tested varieties, Shanthi boiled flour had the highest WAI. When comparad to sweet potato varieties, wheat flour (140.00%) and soy flour (193.33%) had low WAI. All the six tested sweet potato varieties (both boiled and raw forms) had high water absorption indices above 200% and low water solubility indices less than 40%. Boiling has increased the water absorption capacity and decreased water solubility except in Ama. Low WSI with high WAI of flours suggests that the flours can be used in formulation of some foods such as excruded snacks, dough, processed cheese and bakery products.

Key phrases: CARI 426, Ranabima, Dhawala, Hordi
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Malee, CARI 273

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Technical Sessions : A - 11

Characteristics influenced by acid modifications of tea waste biochars pyrolyzed at different temperatures

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Biochar (BC) is a low cost adsorbent produced by the pyrolysis of biomass which can be used for water remediation purposes. Tea waste is an excellent biomass for BC production since it is an abundant solid waste in Sri Lanka. A systematic comparison was carried out to evaluate the characteristics influenced by post modification of tea waste BC pyrolyzed at 300, 500 and 700 ^{0}C. According to FTIR spectra, intense peaks observed in BC produced at low temperatures (LTBC) at 3500-3200, 2980-2820, 1720-1690 cm-1 corresponding to OH-stretching, aliphatic CH_2, carbonyl stretching vibrations, respectively provided a qualitative indication of a relatively high content of oxygen containing surface functional groups (SFGs) in comparison with BC produced at high temperatures (HTBC). In order to enhance adsorption characteristics, three post modification methods were carried out using hydrochloric, sulphuric and nitric acids. Surface acidities of BC were determined by Bohem titration method. The amounts of phenolic functional groups in all three BC were 73 – 82% higher than that of lactonic and carboxylic SFGs. Nitric acid modification considerably increased the carboxylic acid content while the total acidic FG content was increased by acid modifications. Surface morphology of BC was evaluated by SEM imaging. Observed cation exchange capacity (CEC) values at pH = 10 were up to 7.2 times and 2.7 times higher than that of pH = 3, and 7, respectively and the highest CEC was obtained in the nitric acid modified BC when compared with hydrochloric and sulphur acid treatments. The pH at the point of zero charge of non-modified BC was ranged from 6.3 – 7.5 which were decreased upon acid treatment up to 2.6. The produced BC contained 6.75 – 11.40% ash content whereas the moisture content varied from 6.33– 9.70%.
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