

In Vitro Screening of Food Functionalities of Commonly Consumed Bangladeshi Vegetables and Rice

メタデータ	言語: English 出版者: 公開日: 2019-12-20 キーワード (Ja): キーワード (En): 作成者: SHEKHAR, Hossain Uddin メールアドレス: 所属:
URL	https://doi.org/10.24514/00002894

In Vitro Screening of Food Functionalities of Commonly Consumed Bangladeshi Vegetables and Rice

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Bangladesh is an agro based country. Vegetables that grow in Bangladesh serve as a major source of daily food in general. However, the potency of these everyday consumed vegetables in terms of antioxidant, antimutagenic, antitumor and antibacterial activity against pathogenic microbes and spoilage bacteria etc. has never been known. So attempts have been made to study above parameters taking twelve representative vegetables samples namely: red amaranth (*Amaranthus gangeticus*), spinach (*Spinacia oleracea*), coriander leaves (*Coriendum sativum*) cauliflower (*Brassica oleracea var botrytis*), green bringle (*Solanum melongena*), cabbage (*Brassica oleracea*), kolmi shak (*Ipomoea aquitica*), radish (*Raphanus sativus*), green banana (*Musa paradisiaca*), amaranth leaf (*Amaranthus viridis*), purple bringle (*Solanum melongena*), and mushroom (*Genoderma lucidium*).

H-ORAC activity was found to be in the range of 32.42 (green Banana) - 343.13 (kolmi shak) $\mu\text{mol TE (Trolox}^{\text{®}}\text{ equivalent)}/\text{g DW}$ (Dry weight). DPPH-RSA was 288.315(mushroom)-753.42 (kolmishak) $\mu\text{molTE}/\text{gDW}$. TPP was ranged from 36.12 (coriander leaf) to 328.91 (purple bringle) mg GAE (galic acid equivalent) /g DW. Kolmi shak showed highest antioxidant activity in terms of H-ORAC and DPPH-RSA. Correlation between H-ORAC & DPPH-RSA, HORAC & TPP, and DPPH & TPP were found to be 0.60, 0.09 and 0.03 respectively.

The DMSO extract of all these vegetables demonstrate antimutagenic effect on Trp-P2 induced mutagenicity to *Salmonella typhimurium* TA98 while tested with Perilla as standard. The anti-mutagenic activity demonstrated by all these vegetables showed wide range of variation with Red amaranth with highest activity (69.11 %) and Coriender leaves with lowest 6.76%.

The DMSO extract of Eggplant (green), Water spinach, Red amaranth and Eggplant (purple) showed highest anti tumor activities in P388 leukemia cell line. Six vegetables extract showed antibacterial activity against spoilage bacteria. Coriender leaves, showed maximum activity against three spoilage bacteria namely *Pseudomonas aeruginosa*, *Enterococcus faecalis*, *Bacillus subtilis*. Water Spinach's extract was found to be active against four pathogenic bacteria.

The physicochemical and pasting (rheological) properties between Bangladeshi traditional and high yielding variety (HYV) of Indica rice has been compared. 7 representatives of traditional indica parboiled rice namely Dudhkolom, Ashiana, Kajalsail, Dadkhani, kataribhog, Jalidhan and 7 high yielding varieties namely BRR22, BRRI23, BRRI28, BRRI 29, BRRI 31, BRRI40, BRRI 41 have been chosen based on their popularity and availability. The flour particle size obtained after grinding ranged from 204.05 μm (Ashiana)-311.85 μm (Magursail) for traditional variety and 224.87 μm (BRRI 31)-281.70 μm (BRRI 28) for HYVs. The overall hardness of the rice grain range from 262800 N/m² (Kataribhog)- 458200 N/m² (Magursail) for traditional varieties and 343800 N/m² (BRRI 29)- 461300 N/m² (BRRI 31) for HYV. In white index BRRI 22 has been found to be the most white rice grain among all fourteen varieties.

Amylose content (AC) ranged from 21.18 % (Kajal sail)-25.81% (Dudhkolom) for traditional variety and 22.16%

(BRRI 31)-30.37% (BRRI 22) for HYV. The protein content of traditional varieties lie between 6.09 % (Dudhkolom)-8.76% (Jolidhan) and that of HYV lied between 7.82 % (BRRI 41)- 9.09 %(BRRI 31). Gel consistency test reveal that all the varieties have soft gel consistency.

Rheological properties namely peak viscosity (PV), trough viscosity (TV), breakdown viscosity (BV), final viscosity (FV) and setback viscosity (SV) have been determined for all the 14 samples. It has been found that varietal differences cause significant difference in these parameters.

Thirty different free amino acids with variable amount have been detected in all the fourteen samples. Seven tasty amino acids (Ala, Gly, Gln, Glu, Asn,Thr, Asp) have been detected in all varieties. Kataribhog contain the highest amount of these tasty amino acid and Kajalsail the least. Different amount of Gamma amino butyric acid (GABA) has been found in all the varieties. BRRI 22 contain the highest (12.33mg/gm dry basis).