

Sensory and nutritional evaluation of developed functional beverage using underutilized foods

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Underutilized plants are species with under-exploited potential for contributing to food security and nutrition by combating 'hidden hunger' caused by micronutrient deficiencies. The present study was carried out to develop a functional beverage from underutilized foods. Functional beverage was prepared by using whey water, pearl millet, cauliflower leaf powder, banana and jaggery at three different levels i.e. S₁, S₂ and S₃. The developed functional beverage was organoleptically evaluated by a panel of judges and students by using nine-point hedonic scale. Both the panels gave the highest overall acceptability scores to the S₁ level which was prepared by using 2.5g cauliflower (*Brassica oleracea* var. botrytis) leaf powder, 5 g pearl millet (*Pennisetum typhoideum*), 10g jaggery, 20g banana and 63ml whey water per 100ml. The most acceptable level of developed functional was analyzed for proximate composition which showed that it had 81g of moisture, 2.8 g of crude protein, 0.4g of crude fat, 0.9g of crude fibre, 0.85g of ash, 14.05g of carbohydrates and provided 71 Kcal of energy. Developed functional beverage had 11.8g total soluble sugars, 4.55g of reducing sugars and 7.25g of non-reducing sugars. The concentration of minerals iron and calcium in functional beverage was 5.51mg and 103mg, respectively. The concentration of vitamins, ascorbic acid and β -carotene was 2.7 mg and 1185 μ g/100ml, respectively.

Key Words : Hidden hunger, Cauliflower (*Brassica oleracea* var. Botrytis), Pearl millet (*Pennisetum typhoideum*), Whey water, Functional beverage

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INTRODUCTION

Many underutilized species are nutritionally rich and adapted to low input agriculture. Underutilized species offer untapped potentials to contribute to fight malnutrition. Their enhanced use can bring about better nutrition. Emphasis should thus be given to those species having comparative advantages in providing better food, being affordable by the poor and more available both in time and space.

In India, the consumption of green leafy vegetables is very low and is much below the recommended dietary allowances. Therefore, majority of Indians don't meet sufficient vitamins and minerals present in leafy vegetables. Cauliflower (*Brassica oleracea* var. Botrytis) bears extensive

leaves which are removed and discarded prior to cooking. The proportion of cauliflower and leaves arriving in the market is 2:1 of which the discarded leaves contribute to approximately 50 per cent of total production of cauliflower and dehydrated greens are considered concentrated sources of nutrients, addition of small amounts of these foods in various dietary preparations could be of immense value to combat the global prevalence of micronutrient malnutrition (Kowsalaya and Vidhaya, 2004).

Whey is a nutritious by-product from cheese, chhana and paneer containing valuable nutrients like lactose, proteins, minerals and vitamins etc., which have indispensable value as human food. It is estimated that about 100 million kg of whey is annually derived as a by-product which may cause substantial loss of about 70,000 tonnes of nutritious whey solids. In addition, it is adding biological oxygen demand (BOD) load to effluent (approx 35,000 to 45,000 mg / l) (Parekh, 2006).

In India, Pearl millet (*Pennisetum typhoideum*) is the fourth most important staple food crop after rice, wheat, and sorghum. The grain of pearl millet is particularly rich in iron and zinc and

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