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RESEARCH PAPER

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Studies on standardization of malting process for finger millet (ragi)

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ABSTRACT

Finger Millet (*Eleusina coracana*) is one of the neglected millets that save the poor from starvation in developing countries. Finger millet is very good source of micronutrient which could alleviate the wild spread micronutrient malnutrition in the vulnerable segments in the developing country like India. However, millets also contain some anti-nutritional factors which interfere mineral and protein availability. To overcome from these nutritional problems, processing technique such as malting can be used to improve the availability and digestibility of nutrient in addition to improvement of organoleptic quality. But malting for prolonged period also results in significant loss of dry weight. Hence, in present investigation efforts were made to standardize the malting process of finger millet and to assess its nutritional and mineral composition, while high *in vitro* protein digestibility (IVPD), *in vitro* starch digestibility (IVSD) and desirable low viscosity characteristics are considered as criteria for deciding standard method for preparation of finger millet malt. Malt obtained by 16 hrs soaking at room temperature and 48 hrs sprouting in BOD incubator (25^{0}C temperature) considered as standardized maltinig procedure for present study as these malting conditions gave highest amount of IVPD, IVSD and desired low paste viscosity with moderate malt yield.

KEY WORDS : Finger millet, *Eleusina coracana,* Malting, Protein digestibility

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INTRODUCTION

Millets are the numerous small seeded grains and grasses which are originated in Asia and Africa. As per economic stand point the most important millets are finger millet (*Eleusina coracana*), pearl millet (*Panicum americanum*), proso millet (*Panicum miliaceum*) and foxtail millet (*Setaria italica*). Finger millet (*Eleusina coracana*) is also known as *African millet, Koracan Ragi and bajari*. Finger millet constituted about 81% of the minor millets produced in India (Balaravi, 2005). India held first rank in millet production with total production around 10,610,000 tonnes in 2007 (FAO STAT, 2007). In recent years finger millet has gained importance due to its nutritional strength in terms of dietary fiber, functional fiber, starch pattern as well as high calcium and iron content.

The effect of malnutrition on health status has been recognized since antiquity. Studies showed that deficiency of nutrients especially micronutrient will lead to development of cancer. Micronutrient are now claimed to be potent protective agents that act by suppressing carcinogenesis (Grentz and Massey, 2002). Finger millet is good source of minerals specially calcium, phosphorus and iron. According to experimental study, cancer patients feed with enriched finger millet malt has improved their nutritional status (Asha *et al*., 2004). Finger millet is very good source of micronutrient which could alleviate the wide spread micronutrient malnutrition in the vulnerable segments in the developing country like India. However, it must be pointed out that, millets also contains some anti-nutritional factors which interfere mineral and protein bioavailability. Finger millet contains phytic acid, tannins and trypsin inhibitors which are the main anti-nutritional factors normally present (Nagenahally *et al.*, 1983). Tannin reduces the nutritional quality of food as they can bind both exogenous and endogenous proteins including enzymes in the digestive track, affecting utilization of proteins (Ravindran, 1991).

To overcome from all these nutritional problems, malting could be implied as a technoeconomically feasible

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