



Review

Nutritional constituents of pseudo cereals and their potential use in food systems: A review

Nisar Ahmad Mir, Charanjit Singh Riar, Sukhcharn Singh*

Department of Food Engineering & Technology, Sant Longowal Institute of Engineering & Technology, Longowal, Punjab, 148106, India

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ABSTRACT

Consumers are more focused to adopt healthy life styles and appropriate nutritional habits. From the variety of plants which can be potentially used for human nutrition, today fewer and fewer species are used due to elevated risk of health related problems. Results from a number of recent studies have highlighted the need for an improvement in the nutritional quality of cereal based gluten free products. In order to meet the demands of the growing population new food stuffs are being continuously investigated with the aim to improve the diet and conduce to a better health state. At present attention of researchers is more focused towards the exploitation of alternative crops or underutilized species for multifarious uses. Interest in the pseudo cereals has aroused considerably due to their excellent nutritional, phenolic and phytochemical profile and their use in development of gluten free products. Moreover, the amino acid profile and nutritional properties like essential amino acid index, biological value, protein efficiency ratio and nutritional index of pseudo cereals are higher as compared to conventional cereals like wheat rice and maize. Recent studies have indicated that phenolics present in pseudo cereals have several health benefits like prevention and reduction of oxidative stress, anti-cancer, anti-diabetic, anti-inflammatory, anti-hypertensive and prevention of cardiovascular diseases. Therefore, commercialization of these pseudo cereals would help to combat various health related issues, and also the availability of palatable pseudo cereal containing gluten-free products would represent advance towards ensuring an adequate intake of nutrients in subjects with celiac disease.

1. Introduction

The greatest threat to the survival of humanity is the ever-increasing gap between population growth and food supply. FAO, in its annual report “The State of Food Insecurity in the World 2017”, estimates that the number of chronically undernourished people in the world is estimated to have increased to 515 million, up from 777 million in 2015 although still down from about 900 million in 2000 (Kline et al., 2017). From the nutritional point of view, the usefulness or functionality of any grain as human food depends primarily on the quantity and quality of protein. Proteins are an important group of bio-macromolecules that are involved in the physiological functions. Natural vegetable proteins are useful materials owing to their safeness, high biocompatibility, nutritional value and low cost. Hence, finding new vegetable proteins rich in essential amino acids is important for food and pharmaceutical industries (Bergamo, Maurano, Mazzarella, Gianfrani, & Rossi, 2011). The grain functionality principally depends on the genetic makeup and impact of environmental factors on its principal components like carbohydrates, proteins, vitamins, minerals and phenolic phytochemicals.

Due to this reason many cereals crops may be either rich in one component or may be deficient in other compound. In order to overcome this condition, much attention has been centered on the exploitation and utilization of unusual food plants, such as Andean pseudo cereals. There is a considerable interest in Andean pseudo cereals for their nutritional potential, phytochemical content and their use in gluten free products. This new plant species has a more important role in the development and diversification of agricultural products and food. Therefore, the development of novel foods from such plant species having multitude of health benefits can offer an excellent opportunity to improve the public health; hence such foods are gaining importance from the scientific community, consumers, and food manufacturers (Gul, Singh, & Jabeen, 2016). Whole pseudo cereal grains such as buckwheat, amaranth and quinoa are also rich in a wide range of compounds e. g flavonoids, phenolic acids, trace elements, fatty acids and vitamins with known effects on human health like prevention and reduction of many degenerative diseases (Gorinstein et al., 2002; Kalinova & Dadakova, 2009; Li & Zhang, 2001; Tomotake et al., 2007). It has been observed that consumption of whole grains have been

* Corresponding author.

E-mail address: sukh_72@hotmail.com (S. Singh).