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Carob as a Carbon Source for Fermentation Technology

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Abstract:

Carob (*Ceratonia siliqua* L.), have wild and cultivated types, is an evergreen tree and widely grown in Mediterranean countries. Wild or cultivated carob has a high total dry weight content (approximately 91-92%) which primarily consist of sucrose, glucose, fructose, and also incorporate minor amounts of minerals, amino acids, and phenolic compounds. The seeds are generally used for the production of locust bean gum and the kibble is used to produce carob powder in western countries or “pekmez” in Turkey.

Finding new carbon and nitrogen sources is important for lab-scale research to provide cheaper substrates for biotechnological processes to reduce costs. In this sense, carob is one of the important sources for any kind of fermentation processes with its rich nutritional ingredients. Carob pod extracts have been used in many lab-scale studies to produce ethanol, citric acid, lactic acid, mannanase, microbial cell protein, and other value-added products by yeasts, algae or fungi in recent years. In this review, we tried that organize all researches about carob pod extract fermentation to prove the suitability of carob pod for biotechnological processes.

Keywords:

Carob, carob pod extract, value-added products, fermentation

1. Introduction

Microorganisms (yeasts, molds or bacteria) use sugar to produce new organic compounds such as acids, gases, alcohol or something else. This metabolic process is called as “fermentation”. (Shetty et al., 2006). Regardless of the fermentation system used, microorganisms need major and minor nutrition for metabolic conversion to get energy and produce organic compounds. Carbon and nitrogen sources can be classified into major nutrition requirements (Madigan and Martinko, 2006). Microorganisms need carbon sources to achieve energy, and nitrogen sources to produce cell materials and components. Pure carbon or nitrogen resources generally used for laboratory applications to carry out the best operation conditions. However, it is not economically effective for

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