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Research Article

Genes expression of cellulase enzyme in four *Aspergillus* species

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Abstract: Production of cellulase is of great importance for industrially processes and developing the metabolic microbes used widely in different fields. *Aspergillus*, as one of fungal genera, serve to produce many enzymes such as cellulase. Twenty-three isolates of fungi belong to four species of *Aspergillus* were obtained from central lab veterinary medicine in Basra, Iraq and screened for maximum cellulolytic activity. Screening of fungal species was done on Petri plate containing carboxymethyl cellulase growth media. Among 23 isolates of fungi, 20 fungal isolates revealed cellulolytic activity and three depicted zero cellulase activity. All isolates of *A. niger* showed strong secretion of cellulolytic activity on agars followed by *A. fumigatus,* with two isolates of *A. flavus* and one isolateof *A. terrus* revealed zero cellulytic activity.The results of relative gene expression of *Aspergillus* species to five cellulase genes cbhb, exogluconase, endogluconase A, endogluconase B, endogluconase C and control B actin gene revealed over expression of *A. niger* compared to other species.

Keywords: Fungi, Aspergillosis, Cellulolytic enzyme, Molecular assay.

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Introduction

Cellulose is one of mostly abundance biological materials deriving from many organisms worldwide. Plants are generally contributing in cellulose pool of biosphere as it synthesis by a process known as the photosynthesis. Hence, cellulose mostly act as a part of vegetal biomasses in addition to lignin and hemicellulose (Saxena et al. 2009; Nidhi et al. 2017). Chemical composition of cellulose involved the units of β-D-glucopyranoside that attached by the bonds of β-D-glucosyl (Ahmed et al. 2017). In nature, this material degraded through an enzyme known as cellulose that consisting principally from 3 enzymes known as β-glucosidase, cellobiohydrolase and endoglucanase, which work synergistically for degrading the units of cellulose to glucose. This process of degradation applies widely among different biological and technological applications like synthesis of amino acids, production of bio-fuel and laundry, pulp, paper and textile industry (Sun & Cheng 2002; Dashtban et al. 2010; Imran et al. 2016). In addition, it can be applied for industrially animal nutrients, pre-treating of agricultural silages and grains used to fed animals through enhancing the nutritional values and performance (Kuhad et al. 2011).

Fungus is crucially contributing for decompressing of cellulose as it accounts about 80% of cellulose degradation among natures in particular in forest ecosystem, in which, fungus plays an important activity for decomposing of biomass. Many species of fungus have the ability for degrading of cellulose (Timo et al. 2017; Hernandez et al. 2018). The most important fungi that capable for production of cellulase are *Aspergillus* (Bansal et al. 2012). Naturally, saprophytic filamentous fungus