



Production of ellagic acid by *Aspergillus niger* GH1 using submerged culture on pomegranate peel powder as substrate

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Introduction. Ellagitannins are compounds that can be hydrolyzed by enzymes releasing HHDP (acid hexahydroxydifenic) group, this group lactonize to form ellagic acid (EA) [1]. EA is only produced at the industrial level by chemical methods. EA has biological properties such as antioxidant [2], among others. So we need to find biotechnological alternatives, to use waste agroindustrial for obtaining metabolites of high industrial interest. In this work, we evaluated the EA accumulation in submerged cultures using pomegranate peel and the *Aspergillus niger* GH1 strain.

Methods. We used a Box-Bhenken design (BBD) 3x3 to evaluate substrate concentration, pH and shake. In this case three levels of each factor were used. Czapeck-Dox medium was used as reported by [3]. Fungal cultures were evaluated at 48 h. All treatments were made in triplicate. EA was measure with the HPLC methodology [4].

Results. According to the experimental BBD matrix, treatment with G code marked maximum EA accumulation was 211.9 (mg/g), Figure 1.

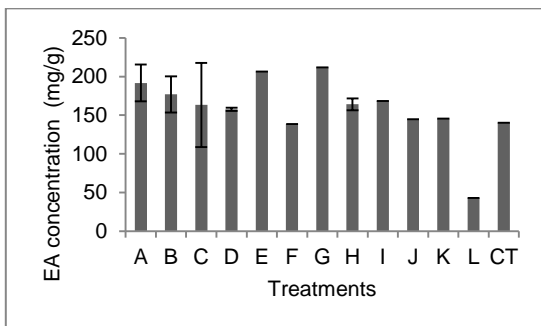


Fig.1 EA accumulation in submerged culture of pomegranate peel.

Substrate concentration (Q) and pH (L) were the variables that most influenced the process of EA accumulation in submerged culture. Negative effects on the process were observed in the two variables, this effect can be decreased as EA values increased, Figure 2.

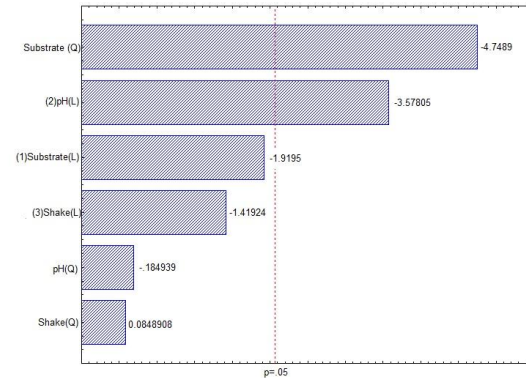
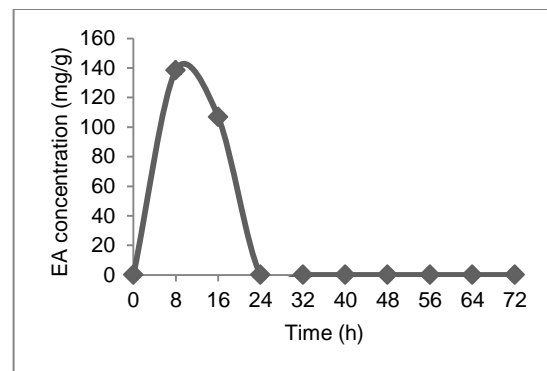


Fig 2. Pareto chart of the variables evaluated of process EA accumulation in submerged culture.

The kinetic profile indicates that during the first 8 h is reached maximum EA accumulation, after 24 h the values remained at zero, Figure 3.



Conclusions. Submerged culture is a good alternative for the biotechnological production of EA using pomegranate peel and the *Aspergillus niger* GH1 strain.

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