PIGMENTS PRODUCTION BY *Monascus purpureus* USING DIFFERENT CULTURE MEDIUMS

Velázquez-Arellano, M.H.[1], Montañez, J.C.[2], Cruz-Hernández, M.A.[1], Méndez-Zavala, A.[2], Morales-Oyervides, L.[3]

[1] Universidad Autónoma Agraria Antonio Narro. Saltillo, México. [2] Universidad Autónoma de Coahuila. Blvd. Venustiano Carranza, 25000. Saltillo, México. [3]University College Cork. Department of Process and Chemical Engineering, Cork, Ireland.
*v.a.male@hotmail.com

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Introduction. The utilization of natural pigments in foodstuff has increased in recent years due to the marketing advantages of employing natural ingredients. The use of filamentous fungi, such as *Monascus*, as a source of food colorant has a long-term history in the orient countries. *Monascus* is known to produce at least six molecular structures of pigment which can be classified into three groups depending on their color. The color specifi- cation of the latter depends on the associated amino acid or protein (1). Growth of *Monascus* species would be directly affected by the composition of the medium (2). The present study aimed to investigate the effect of medium composition on growth and pigment production by*Monascus purpureus*.

Methods. *Monascus purpureus* (DIQ-UadeC) was used in this study. Strain was reactivated on IEPS medium at 30 °C for 10 days. Mycelial growth of *M. purpureus* in five common fungal media was evaluated, including media requirements for growth and pigment production. Standard and commercially available media commonly used for fungal cultivation were selected such as potato dextrose agar (PDA), Sabourad dextrose agar (SDA), Czapek yeast extract agar (CYA), malt extract agar (MEA) and rice medium (RM). Inoculation and incubation conditions were carried out according to the methodology reported by (3). Radial growth rate was calculated by mesuring the radius of each colony during the incubation time. Pigment extraction and cuantification were carried out following the methodology reported by (4).

Results. The results showed that *M. purpureus* was able to grow on all media. However color and texture of mycelium produced were dependent on media type. The radial mycelial growth of this strain was affected significantly by culture media. SDA, MEA and PDA were the best media to promote fungal growth in terms of radial growth with significant differences with the other mediums analyzed after 14 days of incubation (Figure 1). *M. purpureus* presented higher radial growth rate in the mediums SDA and MEA in comparison with PDA, SDA, CYA and RM. MEA and MR were the best mediums for pigment production (OD_{500nm}=0.68 and OD_{500nm}=0.55 respectively) followed by DSA and PDA (OD_{500nm}=0.28 and OD_{500nm}=0.23 respectively) (Figure 2). Pigment prodution was not observed in CYA medium.

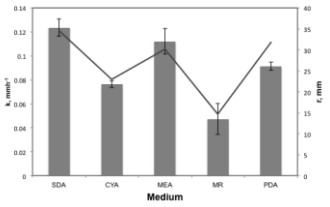

Figure 1. Effect of culture media on radial growth rate and final radius of *M. purpereus*.

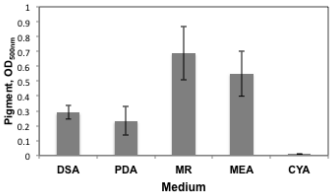

Figure 2. Effect of culture media on pigments produced by *M. purpereus*.

Conclusions. From the results, it can be concluded that SDA and MEA were the most favorable culture mediums for growth of *M. purpureus*. However medium MEA was the most suitable medium for pigment production.

References.

1. Lian X, Wang C, Guo, K. (2007). *Dyes Pigm*, 73(1), 121–125.
2. Lee CL, Hung HK, Wang JJ, Pan TM. (2007). J Agri Food Chem, 55(16), 6493–6502.
3. Nimnoi P, Lumyong S. (2011). Food Bioprocess Technol, 4(8),1384–1390.
4. Benavente-Valdés R. (2011). Tesis de Licenciatura. UAdeC.