

III3. Bioeconomy and Sustainable Development

P178. Low-cost alternative culture media for fungal pigments production

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Natural pigments have several industrial applications, namely in the textile industry for dyeing cloths, or in the food industry, as colouring agents. Pigments can also be used in cosmetics, leather or in the pharmaceutical industry. More recently, other applications were found for pigments like in histological staining, in solar cells or as pH indicators.¹ Conventionally, the natural pigments are extracted from flowers or insect tissues. However, microbial production of natural pigments has been considered a promising alternative. Filamentous fungi are known to produce many different pigments. Recently, some *Penicillium* species, such as *P. chrysogenum* and *P. purpurogenum*, were described as effective pigment producers.

In this work, the production of extracellular pigments by *Penicillium* sp. was evaluated under submerged fermentation conditions using a synthetic medium² and alternative fermentation media containing cheese whey (CW) and corn steep liquor (CSL). Preliminary results indicated that pigment production was favoured when lactose was used as carbon source. Since CW, a by-product from cheese industry, contains high lactose content, it was used as an inexpensive alternative fermentation medium to induce the pigment production. On the other hand, CSL, a major by-product from cornstarch process, has been identified as a potential nitrogen source in biochemical industries. A mixture of three pigments (yellow, orange and red with λ_{\max} =400, 470 and 500 nm, respectively) was obtained. To determine the best conditions for pigment production the sum of the absorbances obtained for the three wavelengths was considered. After 12 days of fermentation, the synthetic medium and media with CW supplemented with 4 g/L yeast extract/peptone (4 g/L) or CSL (1 g/L and 8 g/L) presented the highest pigment production (Figure 1). Furthermore, the supplementation of CW with yeast extract and peptone or CSL allowed a pigment production similar to that obtained with the synthetic medium. These results show that extra supplementation of CW or the use of CSL as alternative source of nitrogen can be a promising strategy to improve pigment production in low-cost fermentation medium.