*Poster*

# Crossflow microfiltration of fungal fermentation broths to obtain natural extracts


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## ABSTRACT

**Motivation:** One of the main milestones after developing a laboratory scale product is to transform the acquired knowledge into an economic production structure. The production of natural extracts in BioflowSur is carried out by using a fermentation process; then, natural extracts are separated from the fungus by vacuum filtration. However, this type of filtration is not feasible with large volumes so that the use of tangential microfiltration with membrane technology was studied.

**Methods:** The fungal fermentation broth was filtrated using a bench-scale crossflow filtration unit (Prozesstechnik GmbH) equipped with a ceramic membrane either of 0,2 µm pore diameter (with active layer) or 5-8 µm pore diameter (without active layer). Two modes of operation were used: concentration and diafiltration. In the first mode the product concentrates in small volumes and in the second mode water is added to facilitate the filtration [1].

**Results:** The diafiltration was discarded as mode of operation after the first test due to the generation of large volumes that complicate the subsequent extraction of the active principle. In addition, results reveal that the optimal temperature is 30ºC because higher temperatures facilitate the passage of residues to the permeate.
The concentration tests performed with the membrane of 0.2 µm showed that there was active principle in the concentrate and in the permeate, while the membrane of 5-8 µm allowed fungus to pass to the permeate after several rounds of filtration. In addition, the high pressures generated due to the fouling drastically reduced the flow and, hence, increased the time of the process [2].

**Conclusions:**

1- The temperature required to carry out the filtration is 30°C.

2- The feed flow has not been optimized, so the fouling has not been reduced.

3- The inability to use an intermediate membrane between the two above makes necessary the search of alternatives, such as a change of polarity of the membrane [3]

## REFERENCES

1. Chacón-Villalobos, A. (2005). Tecnologías de membranas en la agroindustria láctea. Agronomía Mesoamericana, 17(2): 243.
2. El Rayess, Y. et al. (2012). Analysis of membrane fouling during cross-flow microfiltration of wine. Innovative Food Science & Emerging Technologies, 16: 398-408.
3. Venkiteshwaran, A., & Belfort, G. (2010). Process optimization diagrams for membrane microfiltration. Journal of Membrane Science, 357(1-2):105-108.
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