ABSTRACT

The present study was conducted on the Biosynthesis of ergot alkaloids by response surface methodology using *Fusarium oxysporum.* Initially the OFAT technique was used for the identification of carbon and nitrogen factors for the production of ergot alkaloids. The effects of various parameters were checked on the formation of ergot alkaloids such as effect of different carbon and nitrogen sources, various concentration levels of sucrose, yeast extract, KH_2PO_4, $CaCl_2$, $MgSO_4$, $ZnSO_4$ and $FeSO_4.7H_2O$ was seen on the production of ergot alkaloids. The results indicated that 7g sucrose and 9g yeast extract gave the maximum production of ergot alkaloids. The maximum ergot alkaloids production was observed as 1.135±0.024 mg/ml when fermentation medium of pH 5.0. was incubated at 35°C for 5 days with all the optimized culture medium ingredients. This OFAT technique was time consuming and expensive for the ergot alkaloids production. So according to present studies the statistical technique which was used for the identification screening and optimization of different factors in the fermentation medium for the production of ergot alkaloids under the suitable laboratory conditions was used to obtain the maximum yield. This technique helped to increase the yield of ergot alkaloids. In this technique the first step was screening of factors which undergo 12 runs and it includes 11 fermentation factors. This indicated that sucrose, yeast extract and pH played an important role in the enhancement of ergot alkaloids production. In the other step different levels and combined interactions effects of sucrose, yeast extract and pH were observed in Box Behnkenn technique. The purification of ergot alkaloids was done and protein was estimated using acetate buffer. This technique was the most advanced and less time consuming and gives more result in alkaloids production. The yield of ergot alkaloids from *Fusarium oxysporum* appeared as the potential source for upscaling the cost effective and sustainable process through which ergot alkaloids can be used in medical and many therapeutic and pharmaceutical fields.